08-2015

CRYSTAL GROWTH

Züchten von Kristallen

SEMICONDUCTOR SUBSTRATE MANUFACTURING METHOD

[Problem] To provide a semiconductor substrate manufacturing method whereby a semiconductor substrate can be obtained by slicing an epitaxially grown III nitride semiconductor single crystal, while suppressing generation of cracks. [Solution] According to one embodiment of the present invention, a semiconductor substrate manufacturing method includes: a step for epitaxially growing a columnar III nitride semiconductor single crystal (2) on a main surface of a circular substrate (1); a step for removing a cylindrical region (4) on the outer circumferential side of the III nitride semiconductor single crystal (2), and leaving a columnar region (3) on the inner side of the cylindrical region (4) of the III nitride semiconductor single crystal (2); and a step for slicing the columnar region (3) after removing the cylindrical region (4). The cylindrical region (4) is removed such that the shape of the III nitride semiconductor single crystal (2) is constantly axisymmetrical with the center axis of the III nitride semiconductor single crystal (2) as a symmetric axis.

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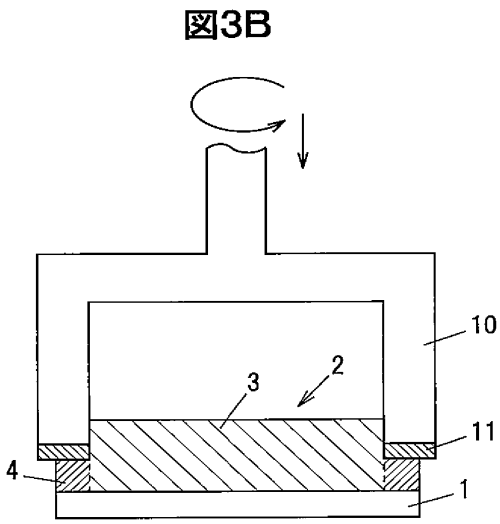
Prio:

Appl.No: JP2014051806

IPC: C30B 29/38 2006.01 (IA)



SILICON CARBIDE EPITAXIAL SUBSTRATE, AND METHOD FOR PRODUCING SILICON CARBIDE EPITAXIAL SUBSTRATE

Provided are: a silicon carbide epitaxial substrate which has good surface properties and in which the background concentration of a nitrogen atom is sufficiently reduced; and a method for producing the silicon carbide epitaxial substrate. The silicon carbide epitaxial substrate (10) is equipped with a base substrate (1) which has face C as the main surface and a silicon carbide epitaxial layer (2) which is arranged on the face C of the base substrate (1). The silicon carbide epitaxial layer (2) contains a layer in which the background concentration of a nitrogen atom is 3 x 1015 cm-3 or less. The production method comprises a step of forming a silicon carbide epitaxial layer (2) on face C of a silicon carbide base substrate (1). In the step of forming the silicon carbide epitaxial layer (2), the ratio (i.e., C/Si) of the number of carbon atoms to the number of silicon atoms in a raw material gas is 1.7 to 2.1 inclusive and the epitaxial growth temperature is 1600 to 1800°C inclusive.

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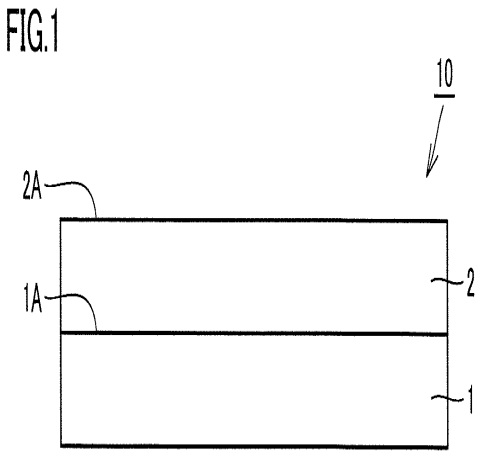
Prio: JP 20140131 2014-017501

Appl.No: JP2014082790

IPC: C30B 29/36 2006.01 (IA)



SILICON WAFER

The present invention inhibits, in forming a nitride semiconductor layer on a silicon wafer through epitaxial growth, the wafer from breaking or from warping significantly because of extended dislocation. The present invention comprises calculating the shape value of a bevel from the values of parameters and regulating the shape of the bevel so as to make the shape value fall within a prescribed range. The shape value is defined by the formula, a1·tanθ1-a2·tanθ2, wherein: a1 (μm) is the first projected length along a front surface (3) between an intersection of an end face (5) and a first inclined face (6) and an intersection of the front surface (3) and the first inclined face (6); a2 (μm) is the second projected length along a back surface (4) between an intersection of the end face (5) and a second inclined face (7) and an intersection of the back surface (4) and the second inclined surface (7); θ1 is the first inclination angle of the first inclined face (6) from the front surface (3); θ2 is the second inclination angle of the second inclined face (7) from the back surface (4); and T (μm) is the spacing between the front surface (3) and the back surface (4).

Publication: WO 2015114974 A1 20150806

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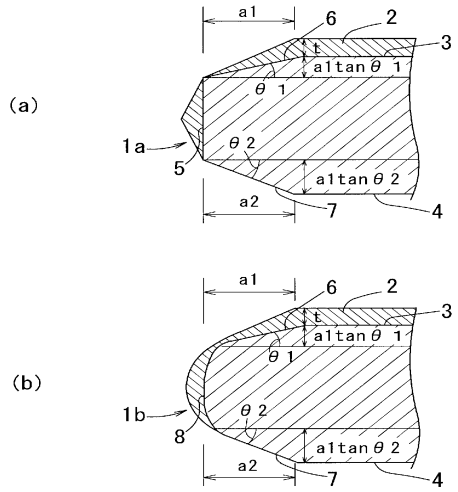
Inventor: SENDA Takeshi, c/o GlobalWafers Japan Co., Ltd., 6-861-5, Seiro-machi Higashiko, Kitakanbara-gun, Niigata, 9570197, JP; IZUNOME Koji, c/o GlobalWafers Japan Co., Ltd., 6-861-5, Seiro-machi Higashiko, Kitakanbara-gun, Niigata, 9570197, JP

Prio: JP 20140128 2014-013092

Appl.No: JP2014083275

IPC: C30B 29/38 2006.01 (IA)

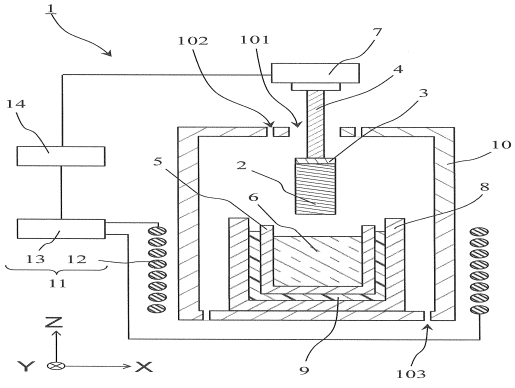


METHOD FOR MANUFACTURING CRYSTAL

This method for manufacturing a crystal comprises: a preparation step for preparing a solution (6) obtained by dissolving carbon in a silicon solvent, and preparing a seed crystal (3) made of silicon carbide; a contact step for bringing the lower surface of the seed crystal (3) into contact with the solution (6); a crystal growth commencement step for raising the temperature of the solution (6) to a prescribed first temperature zone (T1) within a temperature range in which the silicon solvent is in liquid form, and for commencing growth of a crystal (2) made of silicon carbide on the lower surface of the seed crystal (3); a first crystal growth step (A) for, following the crystal growth commencement step, growing the crystal (2) made of silicon carbide by raising the seed crystal (3) while lowering the temperature of the solution (6) from the first temperature zone (T1) to a prescribed second temperature zone (T2) within the temperature range in which the silicon solvent is in liquid form; a solution temperature elevating step (C) for raising the temperature of the solution (6) from the second temperature zone (T2) to the first temperature zone (T1); and a second crystal growth step (B) for, following the solution temperature elevating step, continuing to grow the crystal (2) made of silicon carbide by raising the seed crystal (3) while lowering the temperature of the solution (6) from the first temperature zone (T1) to the second temperature zone (T2).

Publication: WO 2015115543 A1 20150806

Applicant: KYOCERA CORPORATION, 6, Takeda Tobadono-cho, Fushimi-ku, Kyoto-shi, Kyoto, 6128501, JP



Inventor: DOMOTO, Chiaki, c/o KYOCERA CORPORATION, 6, Takeda Tobadono-cho, Fushimi-ku, Kyoto-shi, Kyoto, 6128501, JP; KUBA, Yutaka, c/o KYOCERA CORPORATION, 6, Takeda Tobadono-cho, Fushimi-ku, Kyoto-shi, Kyoto, 6128501, JP; MASAKI, Katsuaki, c/o KYOCERA CORPORATION, 6, Takeda Tobadono-cho, Fushimi-ku, Kyoto-shi, Kyoto, 6128501, JP; HAYASHI, Yuuichiro, c/o KYOCERA CORPORATION, 6, Takeda Tobadono-cho, Fushimi-ku, Kyoto-shi, Kyoto, 6128501, JP

Prio: JP 20140129 2014-014102

Appl.No: JP2015052520

IPC: C30B 29/36 2006.01 (IA)

SEED SHAFT, SINGLE CRYSTAL PRODUCTION DEVICE, AND SINGLE CRYSTAL PRODUCTION METHOD

Provided are a seed shaft and a single crystal production device that are capable of suppressing thermal stress on a seed crystal when producing single crystals using the solution growth method. This production device (10) comprises a seed shaft (20). The seed shaft (20) comprises a shaft member (11) and a holding member (13) arranged at the bottom end of the shaft member (11). The holding member (13) comprises a fixed section (15) attached to the seed crystal and a sliding section (14) attached to a lower surface (11a) of the shaft member (11) so as to be capable of sliding along the lower surface (11a).

Publication: WO 2015118888 A1 20150813

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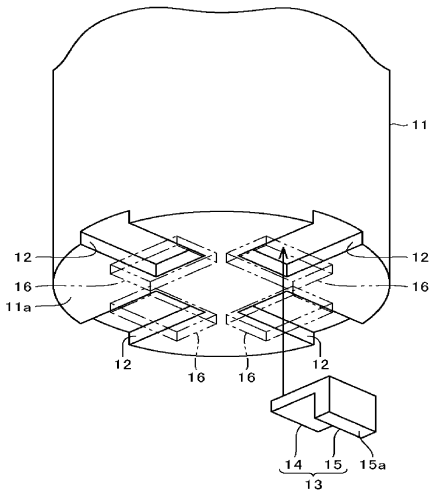
Inventor: KAMEI, Kazuhito, c/o Nippon Steel & Sumitomo Metal Corporation, 6-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 1008071, JP; KUSUNOKI, Kazuhiko, c/o Nippon Steel & Sumitomo Metal Corporation, 6-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 1008071, JP; DAIKOKU, Hironori, c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi, 4718571, JP; SAKAMOTO, Hidemitsu, c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi, 4718571, JP

Prio: JP 20140210 2014-023719

Appl.No: JP2015000582

IPC: C30B 17/00 2006.01 (IA)

FIG. 4



DIAMOND SUBSTRATE AND METHOD FOR MANUFACTURING DIAMOND SUBSTRATE

[Problem] To provide a diamond substrate and a manufacturing method whereby cracking in the diamond substrate can be prevented by releasing stress during crystal growth, and the curvature radius of a crystal face inside the diamond substrate can be reduced to more than 0 km-1 and no more than 1500 km-1. [Solution] In the present invention, the curvature radius of an internal crystal face of a diamond substrate is set to more than 0 km-1 and no more than 1500 km-1 by preparing a base substrate, forming a plurality of columnar diamonds comprising diamond single crystals on one side of the base substrate, growing a diamond single crystal from the distal end of each of the columnar diamonds, coalescing the diamond single crystals grown from the distal ends of the columnar diamonds and forming a diamond substrate layer, separating the diamond substrate layer from the base substrate, and manufacturing a diamond substrate from the diamond substrate layer.

Publication: WO 2015119067 A1 20150813

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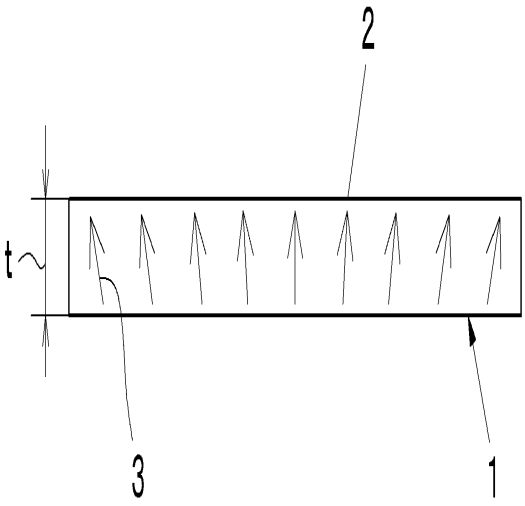
Inventor: AIDA Hideo, c/o NAMIKI SEIMITSU HOUSEKI KABUSHIKIKAISHA, 8-22, Shinden 3-Chome, Adachi-ku, Tokyo, 1238511, JP; KOYAMA Koji, c/o NAMIKI SEIMITSU HOUSEKI KABUSHIKIKAISHA, 8-22, Shinden 3-Chome, Adachi-ku, Tokyo, 1238511, JP; IKEJIRI Kenjiro, c/o NAMIKI SEIMITSU HOUSEKI KABUSHIKIKAISHA, 8-22, Shinden 3-Chome, Adachi-ku, Tokyo, 1238511, JP; KIM Seongwoo, c/o NAMIKI SEIMITSU HOUSEKI KABUSHIKIKAISHA, 8-22, Shinden 3-Chome, Adachi-ku, Tokyo, 1238511, JP



Prio: JP 20140205 2014-020565

Appl.No: JP2015052792

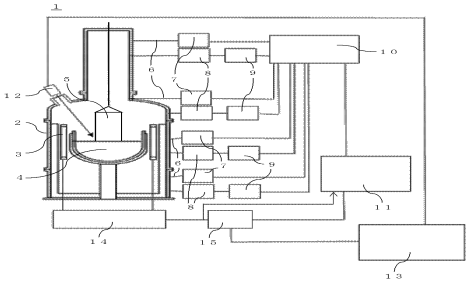
IPC: C30B 29/04 2006.01 (IA)

SILICON SINGLE CRYSTAL PRODUCTION DEVICE

The present invention is a device for producing a silicon single crystal by a CZ process, said device being provided with a chamber having, arranged therein, a heater for heating a raw material and a means for cooling the chamber by a cooling medium. The device for producing a silicon single crystal is equipped with: a means for measuring an inlet temperature, an outlet temperature and a flow amount of the cooling medium, which can cool the chamber, in a flow path through which the cooling medium flows in the chamber; a calculation means for calculating the amount of heat to be removed from the chamber on the basis of measurement values for the inlet temperature, the outlet temperature and the flow amount; and a heater electric power control means for controlling the electric power of the heater on the basis of a calculated value of the amount of heat to be removed. According to this constitution, the electric power of the heater can be controlled on the basis of the amount of heat to be removed from the chamber which is calculated from the measurement values for the temperatures and flow amount of the cooling medium, and therefore it becomes possible to provide a silicon single crystal production device which enables the pulling up of a single crystal at a crystal diameter and a crystal pull-up rate both of which are closer to intended values.

Publication: WO 2015122145 A1 20150820

Applicant: SHIN-ETSU HANDOTAI CO.,LTD., 6-2, Ohtemachi 2-chome, Chiyoda-ku, Tokyo, 1000004, JP



Inventor: YANAGIMACHI, Takahiro, c/o Shirakawa Plant, Shin-Etsu Handotai Co., Ltd., 150, Aza Ohira, Oaza Odakura, Nishigo-mura, Nishishirakawa-gun, Fukushima, 9618061, JP; AKIBA, Masahiro, c/o Shirakawa Plant, Shin-Etsu Handotai Co., Ltd., 150, Aza Ohira, Oaza Odakura, Nishigo-mura, Nishishirakawa-gun, Fukushima, 9618061, JP; TOKUE, Junya, c/o Shirakawa Plant, Shin-Etsu Handotai Co., Ltd., 150, Aza Ohira, Oaza Odakura, Nishigo-mura, Nishishirakawa-gun, Fukushima, 9618061, JP; SONOKAWA, Susumu, c/o Shirakawa Plant, Shin-Etsu Handotai Co., Ltd., 150, Aza Ohira, Oaza Odakura, Nishigo-mura, Nishishirakawa-gun, Fukushima, 9618061, JP

Prio: JP 20140212 2014-024363

Appl.No: JP2015000453

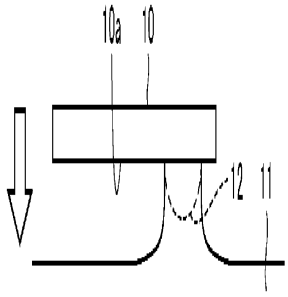
IPC: C30B 29/06 2006.01 (IA)

PRODUCTION METHOD FOR SiC SINGLE CRYSTALS

Provided is a production method for SiC single crystals whereby air is unlikely to enter between seed crystals and a Si-C solution. The production method for SiC single crystals produces SiC single crystals by using a solution growth method whereby main surfaces (10a) of the seed crystals (10) face downwards and are caused to come in contact with the Si-C solution (11) and SiC single crystals are caused to grow on the main surfaces (10a). The main surfaces (10a) are flat. This production method includes a contact step (A), a contact step (B), and a growth step. In contact step (A), part of an area of the main surfaces (10a) is caused to come in contact with stored Si-C solution (11). In contact step (B), the area of contact between the main surfaces (10a) and the stored Si-C solution (11) is expanded by the wetting phenomenon, using an initial contact area being the partial area caused to come in contact in contact step (A) as the starting point therefor. In the growth step, SiC single crystals are grown upon the main surfaces (10a) that have come in contact with the stored Si-C solution (11).

Publication: WO 2015122184 A1 20150820

FIG4C



Applicant: NIPPON STEEL & SUMITOMO METAL CORPORATION, 6-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 1008071, JP; TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi, 4718571, JP

Inventor: KUSUNOKI, Kazuhiko, c/o Nippon Steel & Sumitomo Metal Corporation, 6-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 1008071, JP; KAMEI, Kazuhito, c/o Nippon Steel & Sumitomo Metal Corporation, 6-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 1008071, JP; DAIKOKU, Hironori, c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi, 4718571, JP; SAKAMOTO, Hidemitsu, c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi, 4718571, JP

Prio: JP 20140212 2014-024613

Appl.No: JP2015000629

IPC: C30B 29/36 2006.01 (IA)

METHOD FOR THE PRODUCTION OF A NITRIDE COMPOUND SEMICONDUCTOR LAYER

Es wird ein Verfahren zur Herstellung einer Nitrid- Verbindungshalbleiterschicht beschrieben,umfassend die Schritte: - Abscheiden einer ersten Keimschicht (1), die ein Nitrid- Verbindungshalbleitermaterial umfasst, auf ein Substrat (10), - zumindest teilweises Desorbieren des Nitrid- Verbindungshalbleitermaterials der ersten Keimschicht von dem Substrat (10), - Abscheiden einer zweiten Keimschicht (2), die ein Nitrid-Verbindungshalbleitermaterial umfasst, und - Aufwachsen der Nitrid-Verbindungshalbleiterschicht (3), die ein Nitrid-Verbindungshalbleitermaterial aufweist, auf die zweite Keimschicht (2).

Publication: WO 2015124495 A1 20150827

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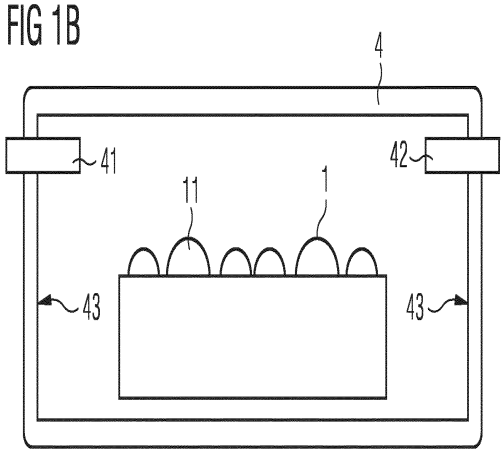
Inventor: OFF, Jürgen, Messerschmittstr. 15, 93049 Regensburg, DE; PETER, Matthias, Diepenbrockstr. 1, 93055 Regensburg, DE; LEHNHARDT, Thomas, Sommestr. 12, 93053 Regensburg, DE; BERGBAUER, Werner, Sandweg 1, 94336 Windberg, DE

Prio: DE 20140218 102014102039.1

Appl.No: EP2015053004

IPC: C30B 29/38 2006.01 (IA)

FIG 1B



METHOD FOR MANUFACTURING SILICON SINGLE CRYSTAL AND SILICON SINGLE CRYSTAL

The present invention is a method for manufacturing a silicon single crystal, the method being for growing silicon single crystal by the Czochralski process and being characterized in that a silicon single crystal is grown such that the diffusion distance of point defects in the silicon single crystal is equal to or greater than the radius of the silicon single crystal, with the thermal history of a central portion of a silicon single crystal from a melting point (Tm) to a grown-in defect formation end temperature (Td) being conditions therefor. Due to this configuration, the method for manufacturing a silicon single crystal can be provided with which, without requiring expensive additional equipment for the manufacturing of single crystals to be installed or the like, point defects can be diffused toward the side surface of the single crystal and the formation of grown-in defects and the mixture of Ni regions and Nv regions can be prevented at low cost.

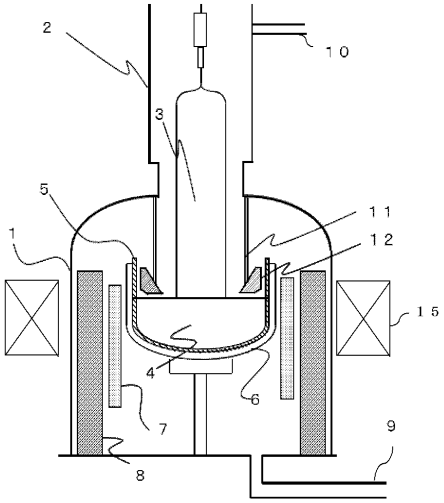
Publication: WO 2015125425 A1 20150827

Applicant: SHIN-ETSU HANDOTAI CO.,LTD., 6-2, Ohtemachi 2-chome, Chiyoda-ku, Tokyo, 1000004, JP

Inventor: HOSHI, Ryoji, c/o Shirakawa R&D Center, Shin-Etsu Handotai Co., Ltd., 150, Aza Ohira, Oaza Odakura, Nishigo-mura, Nishishirakawa-gun, Fukushima, 9618061, JP; TOKUE, Junya, c/o Shirakawa Plant, Shin-Etsu Handotai Co., Ltd., 150, Aza Ohira, Oaza Odakura, Nishigo-mura, Nishishirakawa-gun, Fukushima, 9618061, JP; MATSUMOTO, Suguru, c/o Shirakawa Plant, Shin-Etsu Handotai Co., Ltd., 150, Aza Ohira, Oaza Odakura, Nishigo-mura, Nishishirakawa-gun, Fukushima, 9618061, JP

Prio: JP 20140224 2014-032474

Appl.No: JP2015000489



IPC: C30B 29/06 2006.01 (IA)

FLOAT ZONE SILICON WAFER MANUFACTURING SYSTEM

The process for manufacturing a silicon wafer includes steps for mounting a float zone silicon work piece for exfoliation, energizing a microwave device for generating an energized beam sufficient for penetrating an outer surface layer of the float zone silicon work piece, exfoliating the outer surface layer of the float zone silicon work piece with the energized beam, and removing the exfoliated outer surface layer from the float zone silicon work piece as the silicon wafer having a thickness less than 100 micrometers.

Publication: WO 2015126980 A1 20150827

Applicant: RAYTON SOLAR INC., 25129 The Old Rd, Suite 207, Stevenson Ranch, CA 91381, US

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Prio: US 20140218 61/941,325

Appl.No: US2015016436

IPC: C30B 33/04 2006.01 (IA)

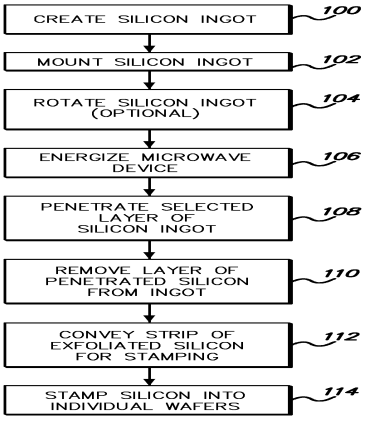

FIG. 1

SEQUENTIAL LASER FIRING FOR THIN FILM PROCESSING

The present disclosure is directed to methods and systems for processing a thin film. An exemplary method can include irradiating a first region of the thin film with a first laser pulse with a first energy density sufficient to partially melt the first region and cause crystal grain lateral growth from a seed region within the first region after the first laser pulse and irradiating the first region of the thin film with at least one sequential laser pulse with a time interval after the first laser pulse and a second energy density sufficient to delay crystal nucleation and extend lateral crystal growth within the first region without partially melting the film.

Publication: WO 2015127031 A1 20150827

Applicant: THE TRUSTEES OF COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK, 412 Low Memorial Library, 535 West 116th Street, New York, NY 10027, US

Inventor: IM, James, S., 2828 Broadway, Apt. 9E, New York, NY 10025, US; YU, Miao, 524 West 122nd Street 6D, New York, NY 10027, US

Prio: US 20140219 61/941,795, US 20140219 61/941,796, US 20140219 61/941,790

Appl.No: US2015016552

IPC: C30B 13/24 2006.01 (IA)

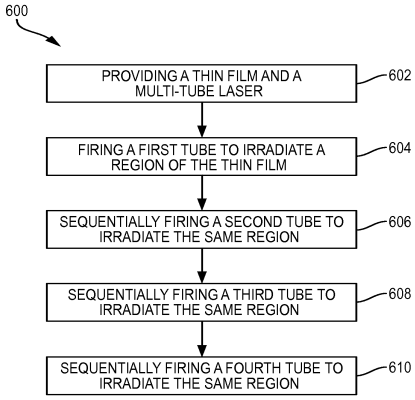

FIG. 6

GROWTH OF LARGE ALUMINUM NITRIDE SINGLE CRYSTALS WITH THERMAL-GRADIENT CONTROL

In various embodiments, non-zero thermal gradients are formed within a growth chamber both substantially parallel and substantially perpendicular to the growth direction during formation of semiconductor crystals, where the ratio of the two thermal gradients (parallel to perpendicular) is less than 10, by, e.g., arrangement of thermal shields outside of the growth chamber.

Publication: US 20150218728 A1 20150806

Applicant: Robert T., Bondokov, Watervliet, US; Shailaja P., Rao, Albany, US; Shawn R., Gibb, Clifton Park, US; Leo J., Schowalter, Latham, US

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Prio:

Appl.No: US14686812

IPC: C30B 23/00 2006.01 (IA)

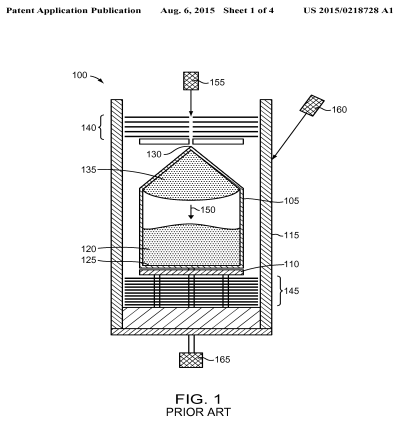


FIG. 1
PRIOR ART

ALUMINUM NITRIDE BULK CRYSTALS HAVING HIGH TRANSPARENCY TO ULTRAVIOLET LIGHT AND METHODS OF FORMING THEM

In various embodiments, methods of forming single-crystal AlN include providing a substantially undoped polycrystalline AlN ceramic having an oxygen concentration less than approximately 100 ppm, forming a single-crystal bulk AlN crystal by a sublimation-recondensation process at a temperature greater than approximately 2000° C., and cooling the bulk AlN crystal to a first temperature between approximately 1500° C. and approximately 1800° C. at a first rate less than approximately 250° C./hour.

Publication: US 20150218729 A1 20150806

Applicant: Sandra B., Schujman, Niskayuna, US; Shailaja P., Rao, Albany, US; Robert T., Bondokov, Watervliet, US; Kenneth E., Morgan, Castleton, US; Glen A., Slack, Scotia, US; Leo J., Schowalter, Latham, US

Inventor: Sandra B., Schujman, Niskayuna, US; Shailaja P., Rao, Albany, US; Robert T., Bondokov, Watervliet, US; Kenneth E., Morgan, Castleton, US; Glen A., Slack, Scotia, US; Leo J., Schowalter, Latham, US

Prio:

Appl.No: US14687993

IPC: C30B 23/02 2006.01 (IA)

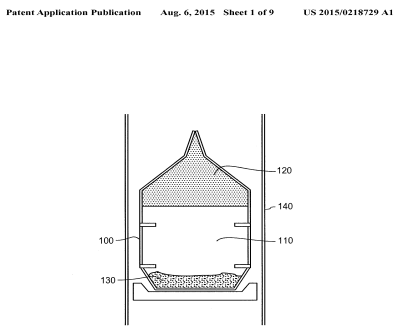


FIG. 1

CRUCIBLE FOR GROWING SAPPHIRE SINGLE CRYSTAL, AND METHOD FOR PRODUCING CRUCIBLE FOR GROWING SAPPHIRE SINGLE CRYSTAL

An object of this invention is to provide a crucible for growing a sapphire single crystal, which is optimized for providing a sapphire single crystal and is reusable. A crucible for growing a sapphire single crystal of this invention includes: a base material (3) containing molybdenum as a main component and having a crucible shape; and a coating layer (5) with which only an inner periphery of the base material (3) is coated and which is formed of tungsten and inevitable impurities, in which the coating layer (5) has a surface roughness Ra of 5 μm or more and 20 μm or less.

Publication: US 20150225870 A1 20150813

Applicant: A.L.M.T. CORP., Tokyo, JP; A.L.M.T. Corp, Minato-Ku, Tokyo, JP

Inventor: Masahiro, Katoh, Toyama, JP; Makoto, Watanabe, Toyama, JP

Prio: JP 20120928 2012-217115, WO 20150324 PCT/JP2013/074641

Appl.No: US14430591

IPC: C30B 11/00 2006.01 (IA)

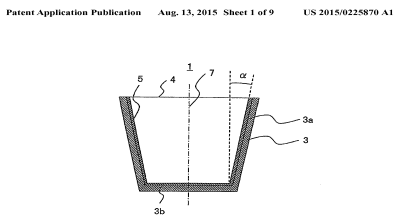


FIG. 1

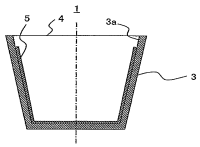


FIG. 2

SiC SINGLE CRYSTAL PRODUCTION APPARATUS AND METHOD OF PRODUCING SiC SINGLE CRYSTALS

A SiC single crystal production apparatus is used in production of SiC single crystals by solution growth techniques. The apparatus includes: a seed shaft having a lower end surface to which a SiC seed crystal is to be attached; a crucible that contains a Si-C solution; a stirring member that is immersed in the Si-C solution; and drive sources that cause relative rotation between the crucible and the stirring member. The lower end of the stirring member is located lower than the lower end of the SiC seed crystal attached to the lower end surface of the seed shaft.

Publication: US 20150225871 A1 20150813

Applicant: TOYOTA JIDOSHA KABUSHIKI KAISHA, Aichi, JP; NIPPON STEEL & SUMITOMO METAL CORPORATION, Tokyo, JP; TOYOTA JIDOSHA KABUSHIKI KAISHA, Aichi, JP

Inventor: Kazuhiko, Kusunoki, Nishinomiya-shi, JP; Kazuhito, Kamei, Kitakyushu-shi, JP; Nobuyoshi, Yashiro, Itami-shi, JP; Nobuhiro, Okada, Kisarazu-shi, JP; Koji, Moriguchi, Nishinomiya-shi, JP; Motohisa, Kado, Gotemba-shi, JP; Hironori, Daikoku, Susono-shi, JP; Hidemitsu, Sakamoto, Susono-shi, JP

Prio: JP 20120904 2012-193725, WO 20150227 PCT/JP2013/005168

Appl.No: US14424538

IPC: C30B 19/04 2006.01 (IA)

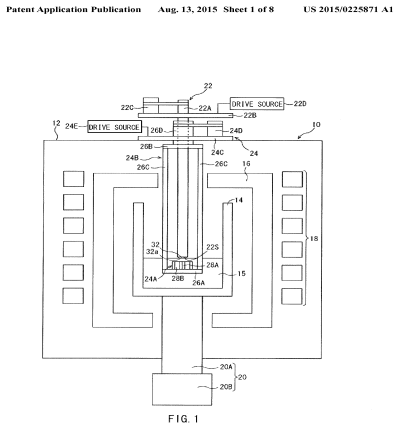


FIG. 1

SINGLE CRYSTAL PRODUCTION APPARATUS, CRUCIBLE FOR USE THEREIN, AND METHOD OF PRODUCING SINGLE CRYSTAL

The production apparatus is used in production of single crystals by solution growth techniques. The production apparatus includes a seed shaft, a crucible, and a drive source. The seed shaft has a lower end surface to which a seed crystal is to be attached. The crucible contains a solution from which a single crystal is made. The drive source causes the crucible to rotate, and also varies the rotational speed of the crucible. The inner peripheral surface of the crucible includes a flow control surface which defines a non-circular cross-sectional shape. This single crystal production apparatus is capable of strongly stirring the solution contained in the crucible.

Publication: US 20150225872 A1 20150813

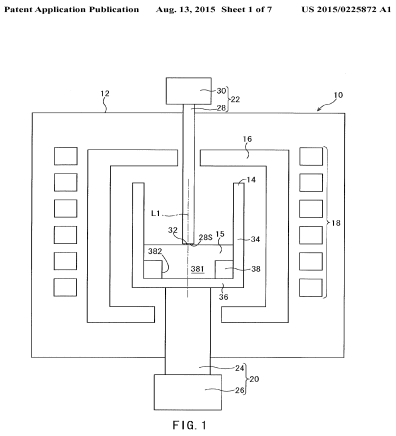
Applicant: TOYOTA JIDOSHA KABUSHIKI KAISHA, Aichi, JP; NIPPON STEEL & SUMITOMO METAL CORPORATION, Tokyo, JP; TOYOTA JIDOSHA KABUSHIKI KAISHA, Aichi, JP

Inventor: Kazuhito, Kamei, Kitakyushu-shi, JP; Kazuhiko, Kusunoki, Nishinomiya-shi, JP; Nobuyoshi, Yashiro, Itami-shi, JP; Nobuhiro, Okada, Kisarazu-shi, JP; Koji, Moriguchi, Nishinomiya-shi, JP; Hironori, Daikoku, Susono-shi, JP; Motohisa, Kado, Gotenba-shi, JP; Hidemitsu, Sakamoto, Susono-shi, JP

Prio: JP 20120904 2012-194250, WO 20150227 PCT/JP2013/005131

Appl.No: US14424578

IPC: C30B 19/10 2006.01 (IA)



METHOD OF MAUFACTURING SILICON CARBIDE SUBSTRATE

A method of manufacturing a silicon carbide substrate has the following steps. A silicon carbide source material is partially sublimated. After partially sublimating the silicon carbide source material, a seed substrate having a main surface is placed in a growth container. By sublimating the remainder of the silicon carbide source material in the growth container, a silicon carbide crystal grows on the main surface of the seed substrate. In this way, an increase of dislocations in the main surface of the seed substrate can be suppressed, thereby providing a method of manufacturing a silicon carbide substrate having few dislocations.

Publication: US 20150225873 A1 20150813

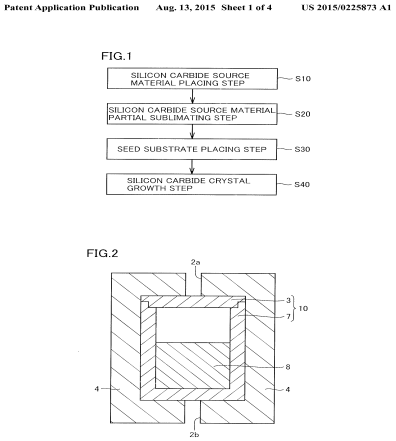
Applicant: SUMITOMO ELECTRIC INDUSTRIES, LTD., Osaka-shi, Osaka, JP; Sumitomo Electric Industries, Ltd., Osaka-shi, Osaka, JP

Inventor: Shinsuke, FUJIWARA, Itami-shi, JP; Taro, NISHIGUCHI, Itami-shi, JP; Tsutomu, HORI, Itami-shi, JP; Naoki, OOI, Itami-shi, JP; Shunsaku, UETA, Itami-shi, JP

Prio: JP 20120726 2012-165995, WO 20141216 PCT/JP2013/066083

Appl.No: US14408422

IPC: C30B 23/06 2006.01 (IA)



METHOD FOR GROWING ZIRCONIUM NITRIDE CRYSTAL

According to the present invention, if a zirconium nitride lattice is grown by a method for growing zirconium nitride using a metal-organic vapor phase epitaxy method, the lattice binding efficiency of ZrN and GaN can enable a low cost preparation of an LED having high performance and it is very advantageous to grow a green LED by a direct band gap in the presence of Zr3N4. In addition, InZr3N4 can be substituted for In when growing a MQW in an LED, and thus it is very advantageous to prepare green and red LEDs. Further, a more satisfactory diffusion current can be obtained using ZrN or Zr3N4 as an epitaxial interlayer, and thus it is very advantageous in the application of a large LED chip and it is possible to prevent thermal expansion or cracks with respect to a silicon substrate.

Publication: US 20150225874 A1 20150813

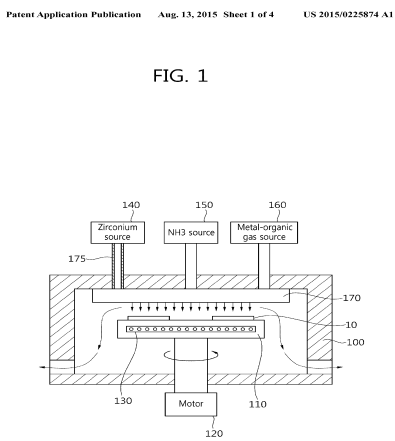
Applicant: SM Technology, Gumi, KR; Sung Moo, Kim, Gumi, KR

Inventor: Sung Moo, Kim, Gumi, KR

Prio: WO 20120821 PCT/KR2012/006632

Appl.No: US14422562

IPC: C30B 25/02 2006.01 (IA)



DENSITY-MATCHING ALKYL PUSH FLOW FOR VERTICAL FLOW ROTATING DISK REACTORS

In a rotating disk reactor for growing epitaxial layers on substrate or other CVD reactor system, gas directed toward the substrates at gas inlets at different radial distances from the axis of rotation of the disk has both substantially the same gas flow rate/velocity and substantially the same gas density at each inlet. The gas directed toward portions of the disk remote from the axis may include a higher concentration of a reactant gas than the gas directed toward portions of the disk close to the axis, so that portions of the substrate surfaces at different distances from the axis receive substantially the same amount of reactant gas per unit area, and a combination of carrier gases with different relative molecular weights at different radial distances from the axis of rotation are employed to substantially make equal the gas density in each region of the reactor. The system may be applied with a combination or carrier gases at multiple gas inlets, a combination of carrier and reactant gases at multiple inlets, and may be used with an arbitrarily large number of gases, when at least two gases of different molecular weights are provided. A linear flow pattern is achieved within the reactor, avoiding laminar recirculation areas, and permitting uniform deposition and growth of epitaxial layers on the substrate.

Publication: US 20150225875 A1 20150813

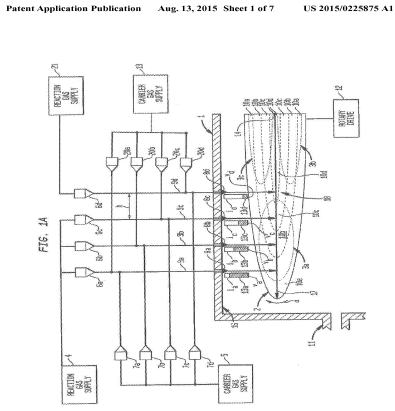
Applicant: Veeco Instruments Inc., Plainview, US

Inventor: Bojan, Mitrovic, Somerset, US; Alexander I., Gurary, Bridgewater, US; William E., Quinn, Whitehouse Station, US; Eric A., Armour, Pennington, US

Prio:

Appl.No: US14618519

IPC: C30B 25/14 2006.01 (IA)



METHODS AND APPARATUS FOR FORMING SEMICONDUCTOR

Method and apparatus for forming free-standing, substantially monocrystalline semiconductor substrates is described. A template substrate is subjected to a process of forming a porous layer on each major surface of the template substrate. The porous layer is smoothed, and then an epitaxial layer is formed on each porous layer. Mechanical energy is used to separate the epitaxial layers from the template substrate, which is recycled by removing any remaining porous and epitaxial material.

Publication: US 20150225876 A1 20150813

Applicant: Applied Materials, Inc., Santa Clara, US
Inventor: TAKAO, YONEHARA, Sunnyvale, US; Karl J., ARMSTRONG, Sunnyvale, US; Fatih Mert, OZKESKIN, Union City, US
Prio:
Appl.No: US14606884
IPC: C30B 33/00 2006.01 (IA)

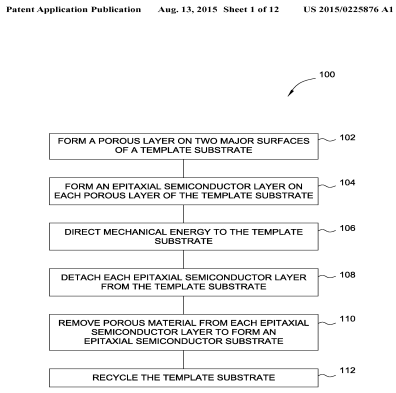


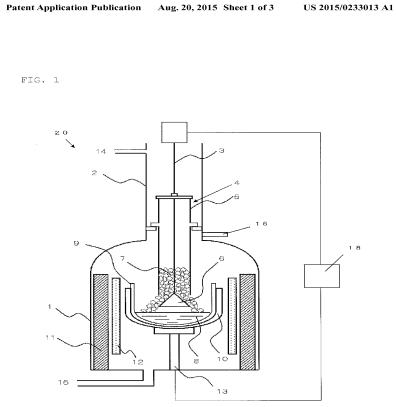
FIG. 1

METHOD OF CHARGING RAW MATERIAL, METHOD OF MANUFACTURING SINGLE CRYSTALS, AND SINGLE-CRYSTAL MANUFACTURING APPARATUS

A method of charging raw material, includes: storing the material in a recharge tube including a quartz cylinder for storing the material and a conical valve for opening or closing an opening at a lower end of the cylinder, installing the recharge tube storing the raw material in a chamber; and feeding the raw material stored in the recharge tube into the crucible by locating the recharge tube and crucible such that a distance between the lower end of the recharge tube and raw material or melt in the crucible ranges from 200 to 250 mm, and lowering the conical valve to open the opening while simultaneously lowering the crucible such that a ratio CL/SL of the lowering speed of the crucible to the lowering speed of the conical valve ranges from 1.3 to 1.45. The method can inhibit damage of the quartz crucible and recharge tube.

Publication: US 20150233013 A1 20150820

Applicant: Shin-Etsu Handotai Co., Ltd., Tokyo, JP
Inventor: Katsuyuki, Kitagawa, Nishigo-mura, JP; Masahiko, Urano, Nishigo-mura, JP; Katsuhiro, Yoshida, Nishigo-mura, JP
Prio: JP 20121120 2012-254568, WO 20150317 PCT/JP2013/006344
Appl.No: US14428745
IPC: C30B 15/02 2006.01 (IA)

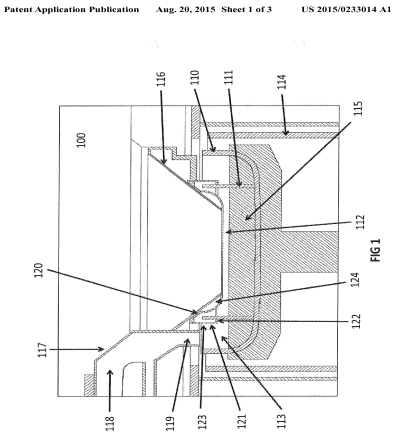


CONTINUOUS CZOCHRALSKI METHOD AND APPARATUS

The present invention relates to a Czochralski growth apparatus and method, preferably a continuous Czochralski growth apparatus and method, in which solid feedstock provided from a delivery system during ingot growth is substantially prevented from entering the growth zone of a crucible. In this way, an ingot having exceptionally consistent properties is produced.

Publication: US 20150233014 A1 20150820

Applicant: GTAT IP Holding LLC, Merrimack, US
Inventor: William L., Luter, St. Charles, US; Weidong, Huang, Bolton, US
Prio: WO 20150303 PCT/US13/58774
Appl.No: US14425422
IPC: C30B 15/12 2006.01 (IA)



METHOD OF GROWTH OF LEAD ZIRCONATE TITANATE SINGLE CRYSTALS

Growth of single crystals of lead zirconate titanate (PZT) and other perovskites is accomplished by liquid phase epitaxy onto a substrate of suitable structural and lattice parameter match. A solvent and specific growth conditions for stable growth are required to achieve the desired proportions of Zr and Ti.

Publication: US 20150233015 A1 20150820

Applicant: Quest Integrated, Inc., Kent, US; Quest Integrated, Inc., Kent, US
Inventor: Vincent, Fratello, Bellevue, US
Prio: WO 20150210 PCT/US2013/072673
Appl.No: US14420896
IPC: C30B 19/12 2006.01 (IA)

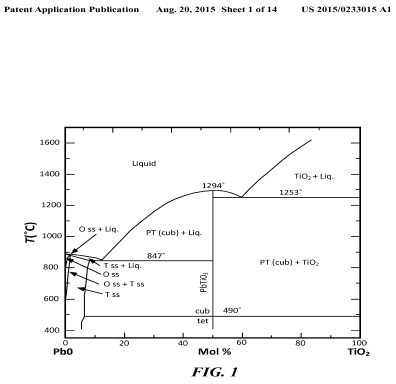


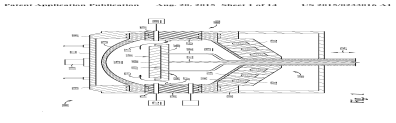
FIG. 1

UPPER DOME WITH INJECTION ASSEMBLY

Embodiments provided herein generally relate to an apparatus for delivering gas to a semiconductor processing chamber. An upper quartz dome of an epitaxial semiconductor processing chamber has a plurality of holes formed therein and precursor gases are provided into a processing volume of the chamber through the holes of the upper dome. Gas delivery tubes extend from the holes in the dome to a flange plate where the tubes are coupled to gas delivery lines. The gas delivery apparatus enables gases to be delivered to the processing volume above a substrate through the quartz upper dome.

Publication: US 20150233016 A1 20150820

Applicant: Applied Materials, Inc., Santa Clara, US



Inventor: Paul, BRILLHART, Pleasanton, US; Anzhong, CHANG, San Jose, US; Edric, TONG, Sunnyvale, US; Kin Pong, LO, Fremont, US; James Francis, MACK, Woodside, US; Zhiyuan, YE, San Jose, US; Kartik, SHAH, Sunnyvale, US; Errol Antonio C., SANCHEZ, Tracy, US; David K., CARLSON, San Jose, US; Satheesh, KUPPURAO, San Jose, US; Joseph M., RANISH, San Jose, US

Prio:

Appl.No: US14613186

IPC: C30B 25/14 2006.01 (IA)

VAPOR PHASE GROWTH METHOD

A vapor phase growth method according to embodiments uses a vapor phase growth apparatus including a reaction chamber, a transfer chamber, and a standby chamber. After a film containing gallium (Ga) is formed on a first substrate, a deposit adhering to a support is covered with a coating film or is removed. After that, an aluminum nitride film is formed successively on a plurality of substrates having a silicon (Si) surface, and the substrates are transferred into the standby chamber. Then, the substrates are transferred sequentially from the standby chamber into the reaction chamber, such that a film containing gallium (Ga) is formed successively on the substrates.

Publication: US 20150233017 A1 20150820

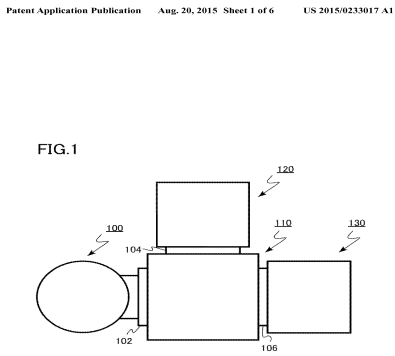
Applicant: NuFlare Technology, Inc., Kanagawa, JP

Inventor: Takumi, YAMADA, Kanagawa, JP; Yuusuke, SATO, Tokyo, JP

Prio: JP 20140220 2014-030324

Appl.No: US14624068

IPC: C30B 25/18 2006.01 (IA)



SILICON CARBIDE EPITAXIAL SUBSTRATE AND METHOD OF MANUFACTURING SILICON CARBIDE EPITAXIAL SUBSTRATE

A silicon carbide epitaxial substrate having a main surface (second main surface) includes: a base substrate; and a silicon carbide epitaxial layer formed on the base substrate and including the main surface (second main surface), the second main surface having a surface roughness of 0.6 nm or less, a ratio of standard deviation of a nitrogen concentration in the silicon carbide epitaxial layer at a surface layer including the main surface (second main surface) within a plane of the silicon carbide epitaxial substrate to an average value of the nitrogen concentration in the silicon carbide epitaxial layer at the surface layer within the plane of the silicon carbide epitaxial substrate being 15% or less.

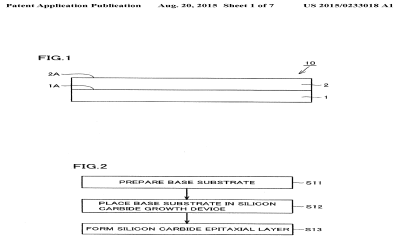
Publication: US 20150233018 A1 20150820

Applicant: Sumitomo Electric Industries, Ltd., Osaka-shi, JP

Inventor: Jun, Genba, Itami-shi, JP; Taro, Nishiguchi, Itami-shi, JP; Hideyuki, Doi, Itami-shi, JP; Akira, Matsushima, Itami-shi, JP

Prio: JP 20130906 2013185384

Appl.No: US14705710



IPC: C30B 29/36 2006.01 (IA)

Method for Producing High Stacking Fault Energy (SFE) Metal Films, Foils, and Coatings with High-Density Nanoscale Twin Boundaries

Materials, including metals such as bulk metals, specialty alloys, metallic films and coatings, are made up of many tiny single crystals, which may also be referred to as grains. The boundaries between crystals are called grain boundaries and govern properties such as mechanical strength, deformation, and electrical resistivity. These properties are affected by not only the number of grain boundaries formed, but also the density and orientation of those grain boundaries. Twin boundaries are a special type of grain boundary which have symmetrical “mirror image” structures and preserve favorable qualities of grain boundaries while suppressing unfavorable properties such as the initiation of cracks, inclusions, and other unwanted flaws. Some metals and alloys form twins more easily than others during processing. Metals with low stacking fault energy (SFE) such as austenitic stainless steel, copper (Cu), and silver (Ag) form twin boundaries more easily than metals with high SFE such as Magnesium (Mg) and Aluminum (Al).

Publication: US 20150233019 A1 20150820

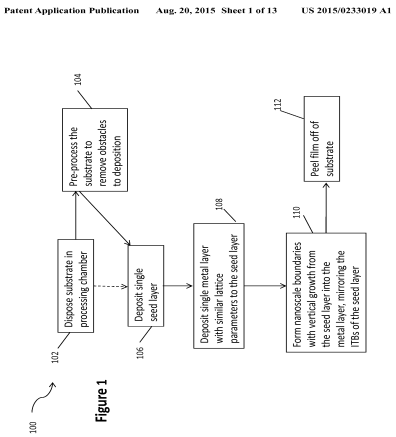
Applicant: THE TEXAS A&M UNIVERSITY SYSTEM, College Station, US; Xinghang, ZHANG, College Station, US; Daniel, BUFFORD, College Station, US; Haiyon, WANG, College Station, US; Yue, LIU, College Station, US

Inventor: Xinghang, Zhang, College Station, US; Daniel, Bufford, College Station, US; Haiyan, Wang, College Station, US; Yue, Liu, College Station, US

Prio: WO 20150316 PCT/US2013/060164

Appl.No: US14428538

IPC: C30B 29/68 2006.01 (IA)



SILICON SINGLE CRYSTAL GROWING APPARATUS AND METHOD FOR GROWING SILICON SINGLE CRYSTAL

A silicon single crystal growing apparatus based on a Czochralski method arranges a graphite crucible inside a graphite heater for heating and a quartz crucible inside the graphite crucible and grows a crystal from a raw material melt filling the quartz crucible, and includes a heater outer heat-insulating member outside the graphite heater, a crucible lower heat-insulating member below the graphite crucible, a crucible upper heat-insulating member above straight bodies of the graphite and quartz crucibles, a crucible outer heat-insulating member outside the straight body of the graphite crucible, a crucible inner heat-insulating member inside the straight bodies of the graphite crucible and the quartz crucible, and a heat shielding member above a liquid surface of the raw material melt, the graphite crucible and the quartz crucible being movable upward and downward in a space enclosed with the crucible upper heat-insulating, crucible outer heat-insulating, and crucible inner heat-insulating members.

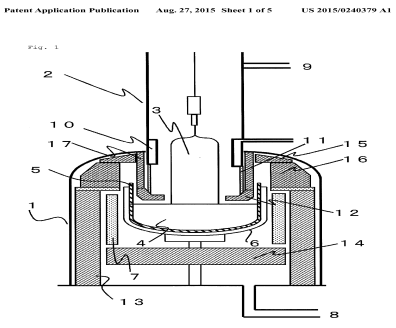
Publication: US 20150240379 A1 20150827

Applicant: SHIN-ETSU HANDOTAI CO., LTD., Tokyo, JP

Inventor: Ryoji, Hoshi, Nishigo-mura, JP; Kosei, Sugawara, Nishigo-mura, JP

Prio: JP 20121003 2012-221472, WO 20150303 PCT/JP2013/005009

Appl.No: US14425394



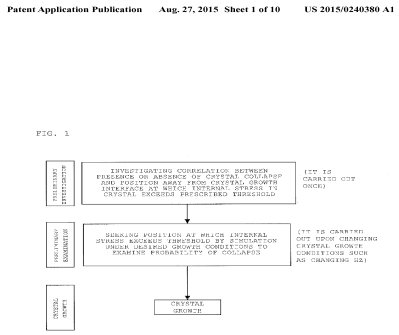
IPC: C30B 15/14 2006.01 (IA)

METHOD FOR GROWING SILICON SINGLE CRYSTAL

A method for growing a silicon single crystal by a Czochralski method, includes: conducting preliminary examination of growth conditions under which crystal collapse does not occur, the preliminary examination being based on a correlation between presence or absence of the crystal collapse in the silicon single crystal and a position at which an internal stress in the crystal when the silicon single crystal is grown will exceed a prescribed threshold, the position being away from a crystal growth interface; and growing the silicon single crystal in accordance with the growth conditions under which the crystal collapse does not occur, the growth conditions being determined from the preliminary examination. The method can grow a silicon single crystal while crystal collapse is effectively prevented.

Publication: US 20150240380 A1 20150827

Applicant: SHIN-ETSU HANDOTAI CO., LTD., Tokyo, JP
Inventor: Ryoji, Hoshi, Nishigo-mura, JP; Masanori, Takazawa, Nishigo-mura, JP
Prio: JP 20120828 2012-187787, WO 20150210 PCT/JP2013/004719
Appl.No: US14420806
IPC: C30B 15/22 2006.01 (IA)



BORON DOPED SINGLE CRYSTAL DIAMOND ELECTROCHEMICAL SYNTHESIS ELECTRODE

Synthetic monocrystalline diamond compositions having one or more monocrystalline diamond layers formed by chemical vapor deposition, the layers including one or more layers having an increased concentration of one or more impurities (such as boron and/or isotopes of carbon), as compared to other layers or comparable layers without such impurities. Such compositions provide an improved combination of properties, including color, strength, velocity of sound, electrical conductivity, and control of defects. A related method for preparing such a composition is also described, as well as a system for use in performing such a method, and articles incorporating such a composition.

Publication: US 20150240381 A1 20150827

Applicant: SCIO Diamond Technology Corporation, Greer, US
Inventor: Robert C., Linares, Wellfleet, US; Patrick J., Doering, Holliston, US
Prio:
Appl.No: US14641920
IPC: C30B 25/20 2006.01 (IA)

SINGLE CRYSTAL CHEMICAL VAPOUR DEPOSITED SYNTHETIC DIAMOND MATERIALS HAVING UNIFORM COLOUR

A coloured single crystal CVD synthetic diamond material comprising: a plurality of layers, wherein the plurality of layers includes at least two sets of layers which differ in terms of their defect composition and colour, wherein defect type, defect concentration, and layer thickness for each of the at least two sets of layers is such that if the coloured single crystal CVD diamond material is fabricated into a round brilliant cut diamond comprising a table and a culet, and having a table to culet depth greater than 1 mm, the round brilliant cut diamond comprises a uniform colour as viewed by naked human eye under standard ambient viewing conditions in at least a direction through the table to the culet.

Publication: US 20150240382 A1 20150827

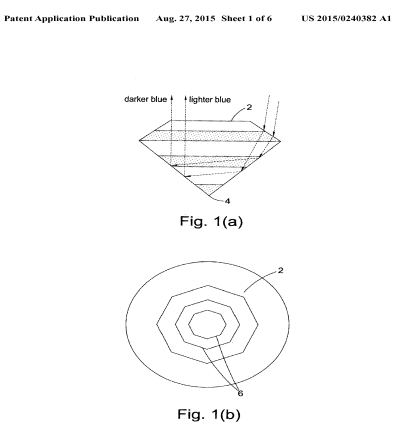
Applicant: ELEMENT SIX TECHNOLOGIES LIMITED, Oxfordshire, GB

Inventor: Harpreet Kaur, Dhillon, Oxfordshire, GB; Ian, Friel, Oxfordshire, GB; Daniel James, Twitchen, Santa Clara, US; Sarah Louise, Geoghegan, Berkshire, GB; Helen Jennifer, Gallon, Oxfordshire, GB; Neil, Perkins, Oxfordshire, GB; Philip Maurice, Martineau, Berkshire, GB

Prio: GB 20120919 1216697.1, WO 20150306 PCT/EP2013/069013

Appl.No: US14426727

IPC: C30B 29/04 2006.01 (IA)



MONOCRYSTALLINE DIAMONDS AND METHODS OF GROWING THE SAME

A monocrystalline diamond having a corrected full width at half maxima after accounting for the Rayleigh width of a 514.5 nm laser, and exhibiting: a presence or absence of negatively-charged silicon vacancy defect depending on the diamond quality; a concentration level of neutral substitutional nitrogen at an absorption coefficient of 270 nm; an FTIR transmittance value at a 10.6 µm wavelength; a concentration of positively-charged substitutional nitrogen when the peak height is at 1332.5 cm-1; an absence of nitrogen-vacancy-hydrogen defect species when the wavelength is at 3123 cm-1; normalisation of spectra when the first order Raman peak is at 552.37 nm using 514.5 nm laser excitation; either a black or white sector and having a refractive index of retardation to thickness of diamond plates; or a reddish glow and a blue glow when the diamond is placed under 355 nm laser irradiation at room temperature in the dark.

Publication: US 20150240383 A1 20150827

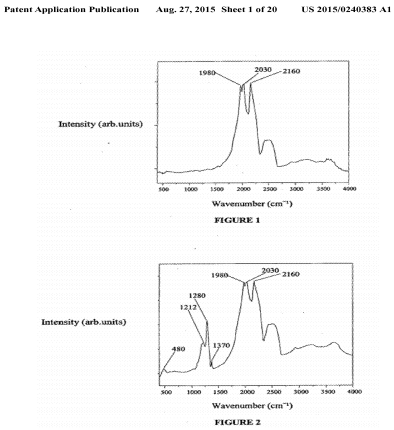
Applicant: IIA Technologies Pte. Ltd., Singapore, SG; IIA Technologies Pte. Ltd., Singapore, SG

Inventor: Devi Shanker, Misra, Singapore, SG

Prio: SG 20080618 200804637-7

Appl.No: US14642422

IPC: C30B 29/04 2006.01 (IA)



Solidification of high quality alloy semiconductors

An alloy semiconductor can be grown using a container including a lower section containing a composition-control source material and an upper section containing a solid. The composition-control source material is heated to produce a vapor, and the solid charge is melted to form a melt with a melt meniscus extending to an inner surface of the container. The vaporized composition-control source material flows from the lower section to the upper and contacts the melt meniscus. The melt is then cooled to form a crystal.

Publication: US 9109299 B1 20150818

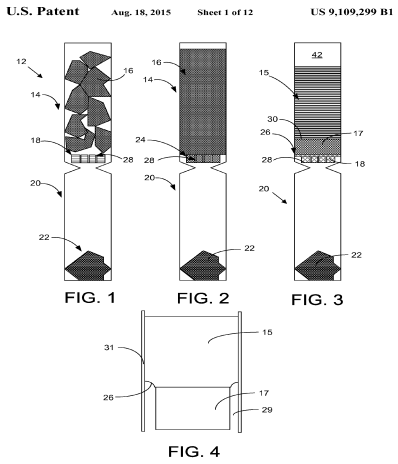
Applicant: CapeSym, Inc., Natick, US; Shariar, Motakef, Weston, US; Piotr, Becla, Arlington, US; Krzysztof, Becla, Arlington, US; Matthew R., Overholt, Upton, US

Inventor: Shariar, Motakef, Weston, US; Piotr, Becla, Arlington, US; Krzysztof, Becla, Arlington, US; Matthew R., Overholt, Upton, US

Prio:

Appl.No: US13075520

IPC: C30B 11/02 2006.01 (IA)



Metal coated crucible for sapphire single crystal growth

The invention is related to a crucible precursor (12) for the manufacture of a crucible (10) for single crystal growth composed of graphite as well as related to a crucible (10) for single crystal growth, with a crucible precursor (12) having an outer wall (12a) and an inner wall (12b), and a refractory metal coating (14) coating at least a part of the inner wall (12b) of the crucible precursor (12). Also disclosed is a method for manufacture the crucible (10) comprising the steps: providing a crucible precursor (12), and coating the inner wall (12b) of the crucible precursor (12) with a refractory metal coating (14).

Publication: EP 2902534 A1 20150805

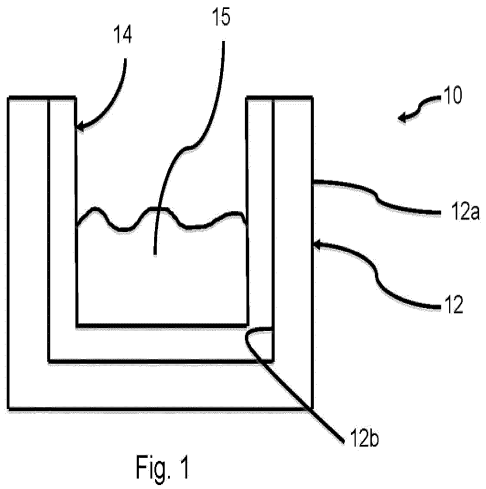
Applicant: SGL Carbon SE, Söhnleinstrasse 8, 65201 Wiesbaden, DE

Inventor: Chen, Kevin, Werner-von-Siemens-Str. 18, 86405 Meitingen, DE; Taetz, Timo, Werner-von-Siemens-Str. 18, 86405 Meitingen, DE

Prio:

Appl.No: EP14153758

IPC: C30B 11/00 2006.01 (IA)



SUBSTRATE FOR EPITAXIAL GROWTH, MANUFACTURING METHOD THEREFOR, AND SUBSTRATE FOR SUPERCONDUCTOR WIRE

An objective of the present invention is to provide a copper substrate for epitaxial growth, which has higher biaxial crystal orientation, and a method for manufacturing the same. The substrate for epitaxial growth of the present invention contains a biaxially crystal-oriented copper layer, wherein the full width at half maximum Δφ of a peak based on the pole figure of the copper layer is within 5° and the tail width Δß of the peak based on the pole figure is within 15°. Such a substrate for epitaxial growth is manufactured by a 1st step of performing heat treatment of a copper layer so that Δφ is within 6° and the tail width Δß is within 25°, and after the 1st step, a 2nd step of performing heat treatment of the copper layer at a temperature higher than the temperature for heat treatment in the 1st step, so that Δφ is within 5° and the tail width Δß is within 15°.

Publication: EP 2905362 A1 20150812

Applicant: Toyo Kohan Co., Ltd., 2-12, Yonbancho Chiyoda-ku, Tokyo 102-8447, JP; Sumitomo Electric Industries, Ltd., 5-33 Kitahama 4-chome Chuo-ku, Osaka-shi, Osaka 541-0041, JP

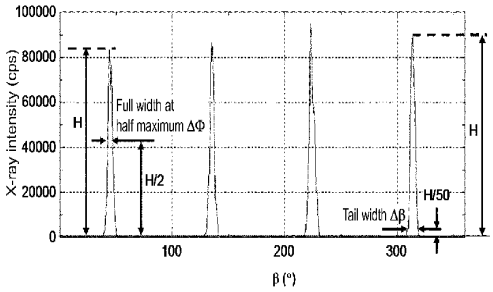
Inventor: KOSHIRO, Takashi, c/o Technical Research Laboratory Toyo Kohan Co. Ltd., 1296-1 Higashitoyoi, Kudamatsu-shi, Yamaguchi 744-8611, JP; OKAYAMA, Hironao, c/o Technical Research Laboratory Toyo Kohan Co. Ltd., 1296-1 Higashitoyoi, Kudamatsu-shi, Yamaguchi 744-8611, JP; KUROKAWA, Teppei, c/o Technical Research Laboratory Toyo Kohan Co. Ltd., 1296-1 Higashitoyoi, Kudamatsu-shi, Yamaguchi 744-8611, JP; NANBU, Kouji, c/o Technical Research Laboratory Toyo Kohan Co. Ltd., 1296-1 Higashitoyoi, Kudamatsu-shi, Yamaguchi 744-8611, JP

Prio: JP 20121005 2012223187

Appl.No: EP13843999

IPC: C30B 29/22 2006.01 (IA)

Fig. 1

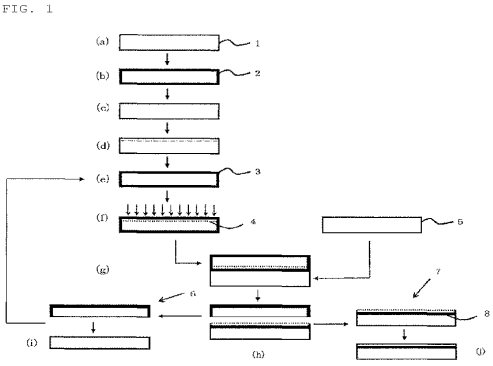


SOI WAFER MANUFACTURING METHOD

The present invention provides a method of manufacturing an SOI wafer, comprising, before forming an oxide film, heat treating a prepared silicon wafer at a temperature ranging from 1100°C to 1250°C under an oxidizing atmosphere for 30 minutes to 120 minutes and polishing a surface of the silicon wafer subjected to the heat treatment, which will become a bonding interface. The method can sufficiently dissolve defects in a bond wafer in SOI-wafer manufacture and manufacture an SOI wafer with few faults such as defects. The method also can repeatedly reuse a separated wafer, which is produced as a by-product in the ion implantation separation method, as the bond wafer.

Publication: EP 2911183 A1 20150826

Applicant: Shin-Etsu Handotai Co., Ltd., 6-2, Ohtemachi 2-chome Chiyoda-ku, Tokyo 100-0004, JP



Inventor: QU, Wei Feng, c/o Isobe R&D Center Shin-Etsu Handotai Co. Ltd. 13-1 Isobe 2-chome, Annaka-shi Gunma 379-0196, JP; TAHARA, Fumio, c/o Isobe R&D Center Shin-Etsu Handotai Co. Ltd. 13-1 Isobe 2-chome, Annaka-shi Gunma 379-0196, JP; OOI, Yuuki, c/o Isobe R&D Center Shin-Etsu Handotai Co. Ltd. 13-1 Isobe 2-chome, Annaka-shi Gunma 379-0196, JP

Prio: JP 20121016 2012229111

Appl.No: EP13846328

IPC: H01L 21/02 2006.01 (IA)

Method for selective deposition of semiconductor material

Verfahren zur selektiven Ablagerung von Halbleitematerial, umfassend: das Bereitstellen eines Substrats, wobei das Substrat ein erstes Material, das ein Halbleitermaterial (102) ist, und ein zweites Material (104), das elektrisch isolierend ist, umfasst; das Aussetzen des ersten und des zweiten Materials mindestens einem Halbleitermaterialvorläufer unter Bedingungen, unter denen das Wachstum von Halbleitermaterial aus dem mindestens einen Vorläufer über das erste und zweite Material eine Verzögerungsphase vor einer Wachstumsphase umfasst und unter denen es länger dauert, bis die Wachstumsphase an dem zweiten Material ausgelöst wird als an dem ersten Material; wobei das Aussetzen ausreichend lange durchgeführt wird, damit die Wachstumsphase an dem ersten Material stattfindet, jedoch nicht lange genug, damit die Wachstumsphase im Wesentlichen an dem zweiten Material stattfindet; wobei das Aussetzen in einer Reaktionskammer in Abwesenheit von Ätzmitteln durchgeführt wird und einen Stoß des mindestens einen Vorläufers als solchem in die Kammer, gefolgt von einer Spülung zum Entfernen des mindestens einen Vorläufers vollständig von innerhalb der Kammer umfasst; wobei eine Sequenz umfassend zwei oder mehr der Stöße benutzt wird, eine Halbleitermaterialdicke zu bilden, wobei auf jeden Stoß eine darauffolgende Spülung folgt; wobei ein anderer Halbleitervorläufer in die Kammer während eines der beiden oder mehrerer Stöße mit Bezug auf einen anderen der beiden oder mehreren Stöße fließend eingeführt wird; und wobei bei jeder Spülung ein Spülgas, das keine Ätzmittel enthält, bevorzugt H2 ohne eine chlorhaltige Komponente verwendet wird.

Publication: EP 1702355 B1 20150819

Applicant: Micron Technology, Inc., 8000 South Federal Way, Boise, ID 83716, US

Inventor: BLOMILEY, Eric, R., 2627 East Red Cedar Lane Apt. 203, Boise, ID 83716, US; SANDHU, Gurtej, S., 2964 East Parkriver Drive, Boise, ID 83706, US; BASCERI, Cem, 12011 Edgemere Circle, Reston, VA 20190, US; RAMASWAMY, Nirmal, 1041 South Dale Street, 201, Boise, ID 83706, US

Prio: US 20040109 755000

Appl.No: EP5705292

IPC: H01L 21/20 2006.01 (IA)

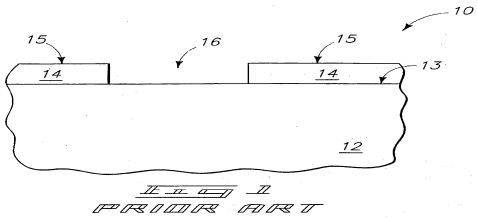


FIG. 1
PRIOR ART

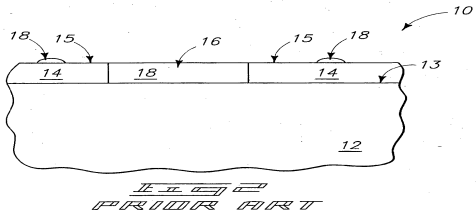


FIG. 2
PRIOR ART

SINGLE CRYSTAL WIRE AND MANUFACTURING METHOD OF THE SAME

Verfahren zum Herstellen eines monokristallinen Drahtes umfassend die nach-folgenden Schritte: Anordnen zumindest eines Metalls ausgewählt aus einer Gruppe umfassend Gold, Kupfer, Silber, Aluminium und Nickel in einem Wachstumstiegel, Erwärmen und Schmelzen des in dem Wachstumstiegel angeordneten Metalls, Züchten eines Monokristalls durch Verwendung des Metallkristalls als Saat mittels des Czochralski oder des Bridgman Verfahrens, Schneiden des gezüchteten Monokristalls mittels Elektroerosion, wobei nach dem Schneideschritt der geschnitte Monokristall mittels Drahterosion oder einer Presse mit einer strukturierten Matrize in Drahtform gebracht wird.

Publication: EP 1794353 B1 20150812

Applicant: Pusan National University Industry-University Cooperation Foundation, Busan National University San 30 Jangjeon 2-dong, Geumjeong-gu Busan 609-735, KR

Inventor: JEONG, Se Young, No. 503-403, Lotte Catsle, Gooseo-dong, Geumjeong-gu, Busan 609-312, KR; CHO, Chae Ryong, Samjeong Greencore Apt. 102-1601, Sajik 2-dong, Dongnae-gu, Busan 607-766, KR; PARK, Sang Eon, 6/7, 380-24 bunji, Buam 3-dong Busanjin-gu, Busan 614-839, KR; KIM, Sung Kyu, Busan National University, DPPL, San 30 bunji, Jangjeon 2-dong, Geumjeong-gu Busan 609-735, KR

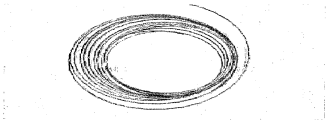
Prio: KR 20040921 20040075550

Appl.No: EP5808344

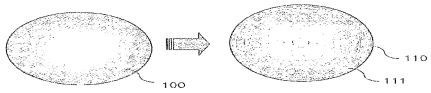
IPC: C30B 15/00 2006.01 (IA)

[FIG.1]

[FIG.2]



[FIG.3]



METHOD FOR MANUFACTURING Si SINGLE CRYSTAL INGOT BY CZ METHOD

Verfahren zur Herstellung eines Si-Einkristallblocks mittels eines CZ-Verfahrens, umfassend: Ermitteln einer Konzentrationsverteilung atomarer Leerstellen in einer radialen Richtung von Wafern, die aus verschiedenen Kristallpositionen von einem Si-Einkristallblock herausgeschnitten wurden, der mittels einer vorhergehenden Ziehbehandlung gewachsen wurde; und Berücksichtigen der Ermittlungsergebnisse bei einer nachfolgenden Ziehbehandlung, um ein Ziehratenprofil bei dem nachfolgenden Ziehen einzustellen, wobei das Ermitteln der atomaren Leerstellen in einem Silizium-Wafer umfasst: Oszillieren eines Ultraschall-Pulses auf eine Waferprobe, die von einer gegebenen Stelle des Silizium-Wafers ausgeschnitten wurde und auf ihrer Oberfläche mit einem Dünnfilm-Transducer versehen wurde; Berechnen einer Verringerungsgröße einer elastischen Konstante, die mit einem Temperaturabfall der Waferprobe in einem Temperaturbereich von nicht über 25 K einhergeht, auf der Grundlage einer Änderung der Schallgeschwindigkeit des durch die Waferprobe propagierten Ultraschall-Pulses; und quantitative Beurteilung eines Typs und einer Konzentration von in der Waferprobe existierenden atomaren Leerstellen auf der Grundlage der berechneten Verringerungsgröße der elastischen Konstante.

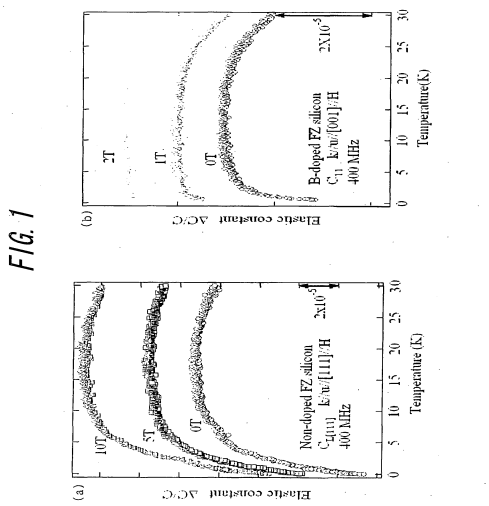
Publication: EP 1997940 B1 20150819

Applicant: Niigata University, 8050, Ikarashi Ninocho, Niigata-shi, Niigata 950-2181, JP; SUMCO Corporation, 2-1, Shibaura 1-chome, Minato-ku, Tokyo 105-8634, JP

Inventor: GOTO, Terutaka, c/o NIIGATA UNIVERSITY 8050, Ikarashi Ninocho, Niigata-shi, Niigata 950-2181, JP; NEMOTO, Yuichi, c/o NIIGATA UNIVERSITY 8050, Ikarashi Ninocho, Niigata-shi, Niigata 950-2181, JP; Kaneta,Hiroshi, c/o NIIGATA UNIVERSITY 8050 ,Ikarashi Ninocho, Niigata-shi, Niigata 9502181, JP; Hourai Masatka, c/o Sumco corporation 2-1 Shibaura 1-chome Minato-ku, Tokyo 105-8634, JP

Prio: JP 20060303 2006058469

FIG. 1



Appl.No: EP7738104
IPC: C30B 29/06 2006.01 (IA)

Ni-BASED SINGLE CRYSTAL SUPERALLOY AND TURBINE VANE USING THE SAME

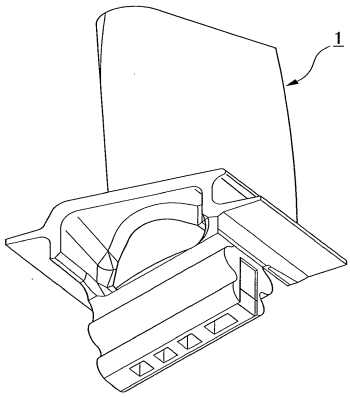
Einkristall-Superlegierung auf Ni-Basis, welche die folgende Zusammensetzung hat: Co: 0,0 Gew.-% oder mehr bis 15,0 Gew.-% oder weniger, Cr: 4,1 bis 8,0 Gew.-%, Mo: 2,1 bis 6,5 Gew.-%, W: 0,0 bis 3,9 Gew.-%, Ta: 4,0 bis 10,0 Gew.-%, Al: 4,5 bis 6,5 Gew.-%, Ti: 0,0 bis 1,0 Gew.-%, Hf: 0,00 bis 0,5 Gew.-%, Nb: 0,0 bis 3,0 Gew.-%, Re: 3,0 bis 8,0 Gew.-% und Ru: 0,5 bis 6,5 Gew.-%, wahlweise die folgenden Bestandteile: B: 0,05 Gew.-% oder weniger, C: 0,15 Gew.-% oder weniger, Si: 0,1 Gew.-% oder weniger, Y: 0,1 Gew.-% oder weniger, La: 0,1 Gew.-% oder weniger, Ce: 0,1 Gew.-% oder weniger, V: 1 Gew.-% oder weniger und Zr: 0,1 Gew.-% oder weniger, wobei der Rest Ni und unvermeidbare Verunreinigungen einschließt, wobei P1 ≤ 700 erfüllt ist, worin P1 einen Parameter 1 darstellt, der durch die Formel P1 = 137 x [W(Gew.-%)] + 24 x [Cr (Gew.-%)] + 46 x [Mo (Gew.-%)] - 18 x [Re (Gew.-%)] erhalten wird.

Publication: EP 2128284 B1 20150819

Applicant: IHI Corporation, 1-1, Toyosu 3-chome Koto-ku, Tokyo 135-8710, JP

Inventor: SATO, Akihiro, c/o IHI Corporation 1-1 Toyosu 3-chome Koto-ku, Tokyo 135-8710, JP; CHIKUGO, Kazuyoshi, c/o IHI Corporation 1-1 Toyosu 3-chome Koto-ku, Tokyo 135-8710, JP; AOKI, Yasuhiro, c/o IHI Corporation 1-1 Toyosu 3-chome Koto-ku, Tokyo 135-8710, JP; SEKINE, Nobuhito, c/o IHI Corporation 1-1 Toyosu 3-chome Koto-ku, Tokyo 135-8710, JP; ARAI, Mikiya, c/o IHI Corporation 1-1 Toyosu 3-chome Koto-ku, Tokyo 135-8710, JP; MASAKI, Shoju, c/o IHI Corporation 1-1 Toyosu 3-chome Koto-ku, Tokyo 135-8710, JP

FIG. 1



Prio: JP 20070312 2007061501
Appl.No: EP8721803
IPC: C22C 19/05 2006.01 (IA)

A PROCESS FOR THE SYNTHESIS OF NANOTUBES AND FULLERENE-LIKE NANOSTRUCTURES OF TRANSITION METALS DICHALCOGENIDES, QUASI ONE-DIMENSIONAL STRUCTURES OF TRANSITION METALS AND OXIDES OF TRANSITION METALS

Verfahren für die Synthese von Nanoröhren von Übergangsmetalldichalkogeniden, von Fulleren-ähnlichen Nanostrukturen von Übergangsmetalldichalkogeniden, und von mit Fulleren-ähnlichen Nanostrukturen von Übergangsmetalldichalkogeniden gefüllten Nanoröhren von Übergangsmetalldichalkogeniden, gekennzeichnet dadurch, dass die Synthese durch chemische Umwandlung quasi-eindimensionaler Materialien erfolgt, die aus Nanodrähten mit einem Durchmesser von weniger als einem Mikrometer bestehen, welche durch die Formel M6CyHz, 8.2<y+z≤10 beschrieben sind, worin M ein Übergangsmetall (Mo, W, Ta, Nb), C ein Chalkogen (S, Se, Te), und H lod (I) darstellt; gekennzeichnet dadurch, dass die chemische Umwandlung in Gegenwart von zumindest einem reaktiven Reagens, welches ein Chalkogen enthält, durchgeführt wird, unter Bedingungen, in welchen das reaktive, ein Chalkogen enthaltende Reagens sich unter erhöhten Temperaturen in der Gasphase befindet, zum Austausch des lods mit einem Chalkogen führen.

Publication: EP 2132142 B1 20150805

Applicant: Institut "Jozef Stefan", Jamova 39, 1000 Ljubljana, SI

Inventor: MRZEL, Ales, Tesovnikova 61, 1000 Ljubljana, SI; REMSKAR, Maja, Kebetova ulica 16, 1215 Medvode, SI; JESIH, Adolf, Planina 113, 6232 Planina, SI; VIRSEK, Marko, Ponova vas 91,

	1290 Grosuplje, SI
Prio:	SI 20070330 200700081, SI 20070925 200700233
Appl.No:	EP8724390
IPC:	C01G 33/00 2006.01 (IA)

POLYCRYSTALLINE THIN FILM AND METHOD FOR PRODUCING THE SAME

Polykristalliner Dünnfilm (10, 20, 36), der eine Zwischenschicht (15, 25, 35) aus einer ersten Schicht (13, 23, 33) und einer zweiten Schicht (14, 24, 34), die in dieser Reihenfolge laminiert sind, umfasst und wobei die Zwischenschicht auf einem Metallsubstrat (11, 21, 31) bereitgestellt ist, worin die erste Schicht eine Steinsalzkristallstruktur aufweist und die zweite Schicht eine Fluoritkristallstruktur aufweist, dadurch gekennzeichnet, dass die erste Schicht aus MgO gebildet ist und die zweite Schicht aus Gd2Zr2O7 gebildet ist, wobei die erste und die zweite Schicht dieselbe Ausrichtungsachsen aufweisen, die <100> ausgerichtet sind, und die erste Schicht und die zweite Schicht durch durch Ionenstrahlen unterstütztes Verfahren ausgebildet sind.

Publication:	**EP 2138611 B1 20150819**
Applicant:	Fujikura Ltd., 5-1, Kiba 1-chome Koto-ku, Tokyo 135-8512, JP
Inventor:	IIJIMA, Yasuhiro, c/o Fujikura Ltd. 5-1 Kiba 1-chome Koto-ku, Tokyo 135-8512, JP; HANYU, Satoru, c/o Fujikura Ltd. 5-1 Kiba 1-chome Koto-ku, Tokyo 135-8512, JP
Prio:	JP 20070329 2007089479, JP 20071101 2007285452
Appl.No:	EP8739278
IPC:	C30B 29/22 2006.01 (IA)

FIG. 1

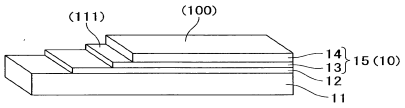


FIG. 2

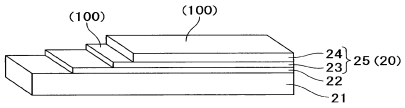
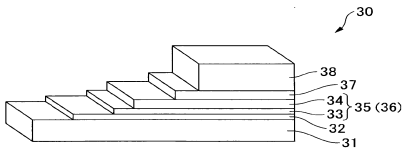


FIG. 3



METHOD OF MAKING NUCLEATION LAYER FOR DIAMOND GROWTH

Methode zur Herstellung einer Nukleationsschicht für die Zucht von Diamanten durch chemische Dampfphasenabscheidung, wobei: Diamantstaub in eine Lösung eines Polymers gegeben wird; diese Suspension homogenisiert wird; das resultierende Polymer-Komposit auf einem gereinigten Substrat abgeschieden wird und auf eine Temperatur getempert wird, welche der Härtungstemperatur des besagten Polymers entspricht, indem das Substrat für mindestens 40 Minuten bei einer Temperatur von 120 °C an der Luft getrocknet wird; und wobei das Polymer-Komposit teilweise weggeätzt wird, dadurch gekennzeichnet, dass: die besagte Lösung eines Polymers eine wässrige Lösung eines Polyvinylalkohols darstellt, welche durch das Lösen von 25 mg Polyvinylalkohol mit einem Molekulargewicht von 80 000g/mol in 1 ml deionisiertem Wasser bei einer Temperatur von 60 - 70 °C unter Rühren hergestellt wird; und es sich bei besagtem Diamantstaub um nanokristallinen Detonationsdiamant mit passivierter Oberfläche und mit Korngrößen zwischen 5 und 10 nm handelt.

Publication:	**EP 2257658 B1 20150826**
Applicant:	Institute of Physics of the AS CR, v.v.i., Na Slovance 2, 182 21 Praha 8, CZ
Inventor:	REZEK, Bohuslav, Nad Okrouhlikem 2351/10, 182 00 Praha 8, CZ; VANECEK, Milan, Darwinova 976/6, 143 00 Praha 4 - Komorany, CZ; KROMKA, Alexander, 338 Lehota, 951 36 Lehota, SK; POTOCKY, Stepan, Tyrsova 449, 417 05 Osek, CZ; POTMESIL, Jiri, Jiraskova 226, 250 82 Uvaly, CZ
Prio:	CZ 20080225 20080104
Appl.No:	EP9714552
IPC:	C30B 29/04 2006.01 (IA)

Large area, uniformly low dislocation density gan substrate and process for making the same

Dampfphasenwachstumsverfahren, das einen Wachstumsreaktor verwendet, um großflächiges III-V-Nitridmaterial aus einem Einkristall mit einheitlich geringer Versetzungsdichte auf einem Substrat zu bilden, wobei ein solches Verfahren enthält (i) eine erste Phase, die einen oder mehrere Schritte des Aufwachsens des III-V-Nitridmaterials auf das Substrat durch eine Wachstumstechnik einer Hydrid-Gasphasenepitaxie unter Wachstumsbedingungen mit Vertiefungsbildung (Pitbildung) enthält, und (ii) eine zweite Phase, die einen oder mehrere Schritte des Aufwachsens des III-V-Nitridmaterials durch eine Wachstumstechnik einer Hydrid-Gasphasenepitaxie unter Bedingungen des Auffüllens der Vertiefungen (Pits), die ein Verschließen der Vertiefungen und eine Vernichtung der Defekte auf einer Wachstumsfläche des III-V-Nitridmaterials bewirken, enthält, wobei die erste Phase und die zweite Phase einen Fluss von Ammoniak und einen Fluss von Chlorwasserstoff zu dem Wachstumsreaktor umfassen, und wobei die zweite Phase ein kleineres Verhältnis des Flusses von Ammoniak zu dem Fluss von Chlorwasserstoff relativ zu der ersten Phase umfasst.

Publication: EP 2267190 B1 20150812

Applicant: Cree, Inc., 4600 Silicon Drive, Durham, NC 27703, US

Inventor: Vaudo, Robert P., 502 Frontage Drive, Cary, NC 27519, US; Xu, Xueping, 23 Dover Street, Westport, CT 06880, US

Prio: US 20031113 712351

Appl.No: EP10010831

IPC: C30B 25/02 2006.01 (IA)

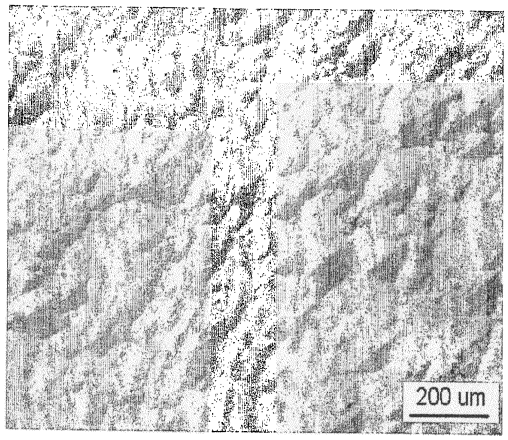


FIG. 1

TUNABLE PHOTONIC CRYSTAL COMPOSITION

Abstimmbare photonische Kristallzusammensetzung umfassend: Partikel aus abstimmbarem photonischem Kristall, wobei jedes Partikel ein Polymernetzwerk mit einer periodischen Modulation von Brechungsindizes hat und das Polymernetzwerk eine Reflexionswellenlänge hat, wobei die periodische Modulation der Brechungsindizes auf einen externen Stimulus reagiert und die Reflexionswellenlänge als Reaktion auf den externen Stimulus verschoben wird, wobei die Partikel aus abstimmbarem photonischem Kristall eine Durchschnittspartikelgröße zwischen etwa 1 µm und 200 µm haben; und mindestens einen Träger, worin die Partikel dispergiert sind, welcher aus der Gruppe ausgewählt ist bestehend aus: einem Bindemittel, einem Lösungsmittel, einem Füllstoff und einem Vernetzungsmittel, wobei sich als Reaktion auf die Anwendung des externen Stimulus aufgrund der Verschiebung der Reflektionswellenlänge des Polymernetzwerks der Partikel aus abstimmbarem photonischem Kristall eine reflektierte Wellenlänge von mindestens einem Teil der Zusammensetzung von einer ersten reflektierten Wellenlänge zu einer zweiten reflektierten Wellenlänge verschiebt.

Publication: EP 2303974 B1 20150819

Applicant: Opalux Incorporated, Lash Miller Laboratories Room 308 80 St. George Street, Toronto, Ontario M5S 3H6, CA

Inventor: ARSENAULT, Andre, 25 Holland Avenue, Toronto Ontario M4B 2C4, CA

Prio: US 20080723 82864 P, US 20081031 109956 P

Appl.No: EP9799911

IPC: C09D 5/33 2006.01 (IA)

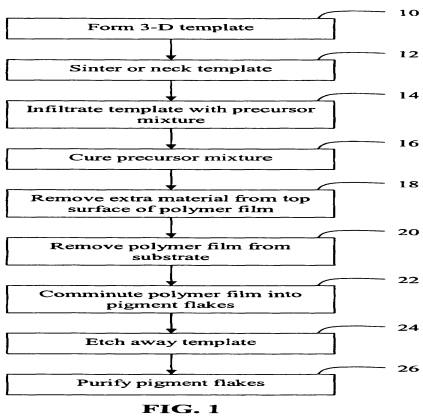


FIG. 1

METHOD AND APPARATUS FOR PRODUCING NITRIDE SEMICONDUCTOR CRYSTAL

Verfahren zur Herstellung eines In(1-x-y)AlxGayN (0 ≤ x ≤ 1, 0 ≤ y ≤ 1, 0 ≤ x + y ≤ 1) Kristalls (10), umfassend: einen Schritt des Herstellens eines Schmelztiegels (101), um im Innenraum ein Ausgangsmaterial zu halten; einen Schritt des Sublimierens des Quellenmaterials (17) im Schmelztiegel durch Erhitzen des Ausgangsmaterials, um eine Kondensation von Ausgangsmaterialgasen zu bewirken und dadurch einen Nitrid-Halbleiterkristall zu wachsen; wobei in dem Herstellungsschritt, ein Schmelztiegel (101) aus einem Metall, dessen Schmelzpunkt höher als der des Ausgangsmaterials (17) ist, hergestellt wird; zwischen dem Schmelztiegelherstellungsschritt und dem Wachstumsschritt, einen Schritt des Bildens eines Abdeckelements (110), der den Außenumfang des Schmelztiegels (101) bedeckt; wobei das Abdeckelement (110) aus einem Metall gebildet ist, dessen Schmelzpunkt höher als der des Ausgangsmaterials (17) ist; einen Schritt des Anordnens eines Heizelements (121) um den Außenumfang des Abdeckelements (110); und einen Schritt des Anordnens einer HF-Spule um den Außenumfang des Heizelements (121) zum Heizen des Heizelements (121), wobei der Schmelztiegel (101) eine Auslassöffnung (101a) aufweist.

Publication: EP 2390386 B1 20150812

Applicant: Sumitomo Electric Industries, Ltd., 5-33 Kitahama 4-chome, Chuo-ku Osaka-shi Osaka 541-0041, JP

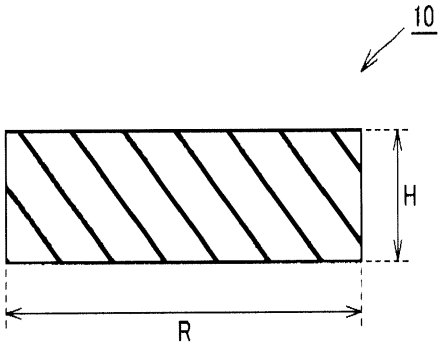
Inventor: SATOH, Issei, c/o SUMITOMO ELECTRIC INDUSTRIES, LTD. 1-1, Koyakita 1-chome, Itami-shi Hyogo 664-0016, JP; MIYANAGA, Michimasa, c/o SUMITOMO ELECTRIC INDUSTRIES, LTD. 1-3, Shimaya 1-chome Konohana-ku, Osaka-shi Osaka 554-0024, JP; YAMAMOTO, Yoshiyuki, c/o SUMITOMO ELECTRIC INDUSTRIES, LTD. 1-1, Koyakita 1-chome, Itami-shi Hyogo 664-0016, JP

Prio: JP 20090116 2009007394, JP 20091225 2009293994

Appl.No: EP10731243

IPC: C30B 29/38 2006.01 (IA)

FIG. 1

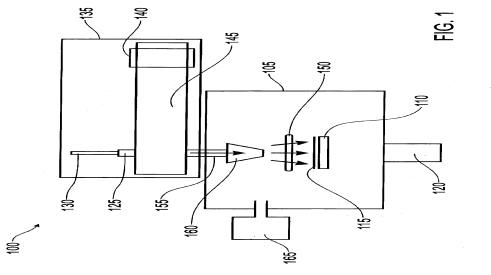


PLASMA DEPOSITION

Ein Gerät (100) geeignet zur Abscheidung eines Gruppe III Metallnitrid - Films auf einem Substrat (115), das Gerät umfassend: (a) einen Plasmagenerator (135) eingerichtet zur Erzeugung eines Stickstoffplasmas au seiner Stickstoffquelle; (b) eine Reaktionskammer (105), geeignet zur Reaktion eines Reagenz umfassend ein Gruppe III Metall mit einer vom Stickstoffplasma abgeleiteten reaktiven Stickstoffspezies, derart, dass ein Gruppe III Metallnitrid auf dem Substrat abgeschieden wird; (c) einen Plasma -Einlass (130), eingerichtet zur Ermöglichung des Durchgans des Stickstoffplasmas vom Plasmagenerator in die Reaktionskammer; und (d) ein Leitblech (160, 210, 300, 400) welches ein oder mehrere Strömungskanäle zur Passage des Stickstoffplasmas aufweist, das Leitblech ist angeordnet zwischen dem Plasmaeinlass und dem Substrat und das Leitblech umfasst eine Mehrzahl von Verteilungselementen (305) angeordnet über einem Sperrelement (315), jedes Verteilungselement definiert eine Öffnung und ist beabstandet von einem benachbarten Verteilungselement und dem Sperrelement, wobei das Leitblech eingerichtet ist, eine geradlinige Passage des Stickstoffplasmas zwischen Plasmaeinlass und Substrat zu verhindern, dadurch gekennzeichnet, dass die Öffnungen welche durch die Verteilungselemente definiert werden bei Annäherung an das Sperrelement immer kleiner werden.

Publication: EP 2396449 B1 20150805

Applicant: Gallium Enterprises Pty Ltd, 74 Asquith Street, Silverwater, NSW 2128, AU



Inventor: REYNOLDS, Guy James, 61 The Ridge, Helensburgh, New South Wales 2508, AU; MARTIN, Conor Nicholas, 2/83 Grasmere Road, Cremorne, New South Wales 2090, AU; GLOWACKI, Piotr, 32 Onthonna Terrace, Umina Beach, New South Wales 2257, AU; WINTREBERT EP FOUQUET, Marie-Pierre Francoise, C/- BluGlass Ltd 74 Asquith Street, Silverwater, New South Wales 2128, AU; BARIK, Satyanarayan, B101/42-50 Brickworks Drive, Holroyd, New South Wales 2142, AU; CHEN, Patrick Po-Tsang, 29/1-15 Fontenoy Road, Macquarie Park, New South Wales 2113, AU

Prio: AU 20090213 2009900611, AU 20090213 2009900612

Appl.No: EP10740845

IPC: C23C 16/30 2006.01 (IA)

Gallium arsenide crystal

Kristall aus Galliumarsenid, welcher eine Verteilung der Versetzungsdichte aufweist und bei dem eine globale Standardabweichung (σglobal) einer die Versetzungsdichte repräsentierenden Ätzgrubendichte (epd) in einer Ebene senkrecht zur Längsachse des Kristalls weniger als 23 % von einem mittleren Wert der Ätzgrubendichte für den Kristall beträgt, wobei der Bestimmung der globalen Standardabweichung eine charakteristische Länge von 5 mm zugrunde liegt, wobei die charakteristische Länge die minimale laterale Auflösung eines Mappings repräsentiert, wobei der Durchmesser 4" oder mehr beträgt.

Publication: EP 2458041 B1 20150812

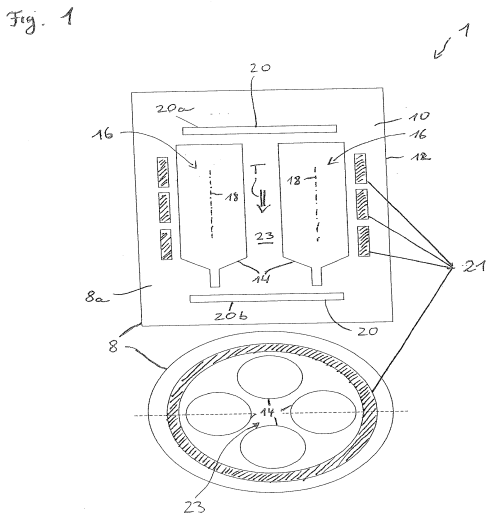
Applicant: Freiberger Compound Materials GmbH, Am Junger Löwe Schacht 5, 09599 Freiberg, DE

Inventor: Eichler, Stefan, Hohe Strasse 133, 01187 Dresden, DE; Bünger, Thomas, In der Laue 28, 21335 Lüneburg, DE; Butter, Michael, Hauptstrasse 32, 09633 Halsbrücke, DE; Rühmann, Rico, Olbernhauer Strasse 21 b, 09544 Neuhausen, DE; Scheffer-Czygan, Max, Weststrasse 117, 09116 Chemnitz, DE

Prio: DE 20070606 102007026298, US 20070606 942298 P

Appl.No: EP12155975

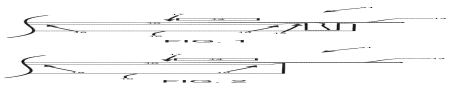
IPC: C30B 29/42 2006.01 (IA)



METHOD OF SHEET PRODUCTION WITH REMOVAL FROM THE SURFACE OF A MELT USING ELASTICITY AND BUOYANCY

Verfahren zur Lagenherstellung, umfassend: Kühlen einer Schmelze (10) eines Materials zum Bilden einer Lage (13) des Materials an einer Oberfläche der Schmelze (10) in einem ersten Bereich bei einer ersten Lagenhöhe (25); Verschieben der Lage (13) horizontal zu der Oberfläche der Schmelze (10) und Anheben eines ersten Abschnitts der Lage (13) vertikal von der Oberfläche der Schmelze (10), so dass der erste Abschnitt der Lage (13) in einem zweiten Bereich angeordnet ist und ein zweiter Abschnitt der Lage (13) in dem ersten Bereich angeordnet ist, wobei der erste Abschnitt der Lage (13) eine zweite Lagenhöhe (26) aufweist, die höher ist als die erste Lagenhöhe (25) und wobei der erste Abschnitt der Lage (13) parallel zu dem zweiten Abschnitt der Lage (13) ist; und Trennen der Lage (13) von der Schmelze (10) in dem zweiten Bereich bei der zweiten Lagenhöhe (26).

Publication: EP 2567001 B1 20150805



Applicant: Varian Semiconductor Equipment Associates, Inc., 35 Dory Road, Gloucester, MA 01930, US

Inventor: KELLERMAN, Peter, L., 94 John Wise Avenue, Essex, MA 01929, US; SUN, Dawei, 409 Quingtong Rd., nr. 9 Room 1301, Pudong New District, Shanghai 201203, CN; HELENBROOK, Brian, 59 Leroy Street, Potsdam, NY 13676, US; HARVEY, David, S., 19 North Street, Westford, MA 01886, US

Prio: US 20110303 201113039808, US 20100506 332062 P

Appl.No: EP11707770

IPC: C30B 11/00 2006.01 (IA)

method, apparatus and crucible for producing SiC single crystal by solution growth

Produktionsvorrichtung (10) eines SiC-Einkristalls durch ein Lösungszüchtungsverfahren, das Folgendes umfasst: eine Keimwelle (30), die eine untere Endfläche (34) aufweist, an der ein SiC-Keimkristall (36) angebracht werden soll; und einen Tiegel (14) zur Aufnahme einer SiC-Lösung (16), wobei der Tiegel (14) Folgendes umfasst: einen Hauptkörper (140), der einen ersten zylindrischen Abschnitt (38) und einem Bodenabschnitt (40) umfasst, der an einem unteren Endabschnitt des ersten zylindrischen Abschnitts (38) angeordnet ist; eine Zwischenabdeckung (42), die innerhalb des ersten zylindrischen Abschnitts (14) und oberhalb des Flüssigkeitspegels der SiC-Lösung (16) in dem Hauptkörper (140) angeordnet ist, wobei die Zwischenabdeckung (42) ein erstes Durchgangsloch (48) aufweist, durch das die Keimwelle (30) hindurch geführt werden soll; und eine obere Abdeckung (44), die über der Zwischenabdeckung (42) angeordnet ist, wobei die obere Abdeckung (44) ein zweites Durchgangsloch (52) aufweist, durch das die Keimwelle (30) hindurch geführt werden soll.

Publication: EP 2722422 B1 20150812

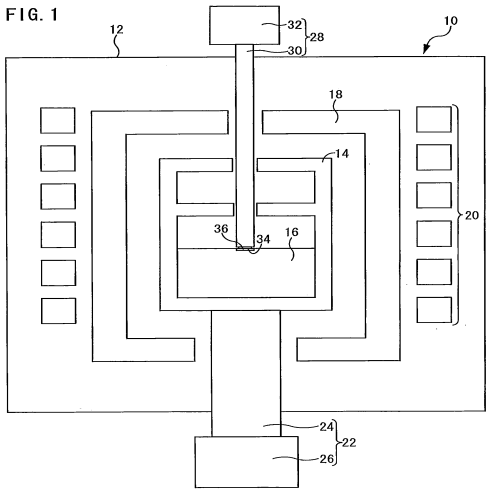
Applicant: Nippon Steel & Sumitomo Metal Corporation, 6-1, Marunouchi 2-chome Chiyoda-ku, Tokyo 100-8071, JP; Toyota Jidosha Kabushiki Kaisha, 1 Toyota-cho, Toyota-shi, Aichi 471-8571, JP

Inventor: KAMEI, Kazuhito, c/o Nippon Steel & Sumitomo Metal Corporation 6-1, Marunouchi 2-chome Chiyoda-ku, Tokyo 100-8071, JP; KUSUNOKI, Kazuhiko, c/o Nippon Steel & Sumitomo Metal Corporation 6-1, Marunouchi 2-chome Chiyoda-ku, Tokyo 100-8071, JP; YASHIRO, Nobuyoshi, c/o Nippon Steel & Sumitomo Metal Corporation 6-1, Marunouchi 2-chome Chiyoda-ku, Tokyo 100-8071, JP; OKADA, Nobuhiro, c/o Nippon Steel & Sumitomo Metal Corporation 6-1, Marunouchi 2-chome Chiyoda-ku, Tokyo 100-8071, JP; DAIKOKU, Hironori, c/o TOYOTA JIDOSHA KABUSHIKI KAISHA 1 Toyota-cho, Toyota-shi Aichi 471-8571, JP; KADO, Motohisa, c/o TOYOTA JIDOSHA KABUSHIKI KAISHA 1 Toyota-cho, Toyota-shi Aichi 471-8571, JP; SAKAMOTO, Hidemitsu, c/o TOYOTA JIDOSHA KABUSHIKI KAISHA 1 Toyota-cho, Toyota-shi Aichi 471-8571, JP

Prio: JP 20110620 2011136600

Appl.No: EP12802264

IPC: C30B 29/36 2006.01 (IA)



HEATING A FURNACE FOR THE GROWTH OF SEMICONDUCTOR MATERIAL

Mehrfachblock-Ofen zum Züchten kristallinen Halbleitermaterials, wobei der Ofen umfasst: Ein Gehäuse, das eine heiße Zone zur Aufnahme einer Anordnung von Halbleitermaterial enthaltenden Tiegeln definiert; wenigstens eine Heizvorrichtung zum Erwärmen des des Halbleitermaterials; dadurch gekennzeichnet, dass die oder jede Heizvorrichtung eingerichtet ist, ein vorbestimmtes differenzielles Wärmeflussprofil auf einen horizontalen Querschnitt des Halbleitermaterials in einem oder mehreren Tiegeln anzuwenden, wobei das Wärmeflussprofil in Abhängigkeit von der Position innerhalb der Anordnung des einen oder der mehreren Tiegel selektiert wird.

Publication: EP 2734661 B1 20150819

Applicant: REC Solar Pte Ltd., 20 Tuas South Avenue, 14, Singapore 637312, SG

Inventor: BAKKE, Per, Storvegen 20, N-3919 Porsgrunn, NO; VLADIMIROV, Egor, Kirkeveien 3, N-3950 Brevik, NO; HOMAYONIFAR, Pouria, Utsikten 26, N-3911 Porsgrunn, NO; TEIXEIRA, Alexandre, Skomvaergata 8 H307, N-3921 Porsgrunn, NO

Prio: GB 20110722 201112610, US 20110722 201161510676 P

Appl.No: EP12748655

IPC: C30B 11/00 2006.01 (IA)

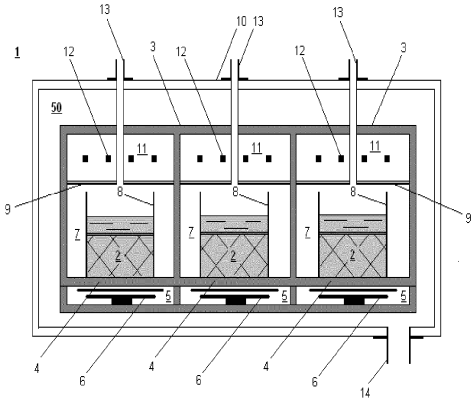


Figure 1

CRUCIBLE AND METHOD FOR THE PRODUCTION OF A (NEAR) MONOCRYSTALLINE SEMICONDUCTOR INGOT

Schmelztiegel (1) für die Herstellung von Ingots aus einem kristallinen Halbleitermaterial, wie etwa Silicium, wobei der Schmelztiegel periphere Seitenwände (1b) sowie einen Boden (1a) umfasst, wobei zumindest ein Teil des Bodens mit einer oberen Schicht (2) beschichtet ist, dadurch gekennzeichnet, dass die obere Schicht (2) eine Dicke δ von zumindest 500 µm besitzt, und dass die obere Schicht bei einer Erweichungstemperatur unter 1400 °C plastisch oder viskos verformbar ist.

Publication: EP 2773797 B1 20150805

Applicant: Vesuvius France S.A., 68 Rue Paul Deudon, 59750 Feignies, FR

Inventor: RANCOULE, Gilbert, 12 Rue de Picardie, F-59700 Marcq-en-Baroeul, FR; MARTIN, Christian, 68 Rue Paul Deudon, F-59750 Feignies, FR

Prio: EP 20111104 11187970

Appl.No: EP12779085

IPC: C30B 11/00 2006.01 (IA)

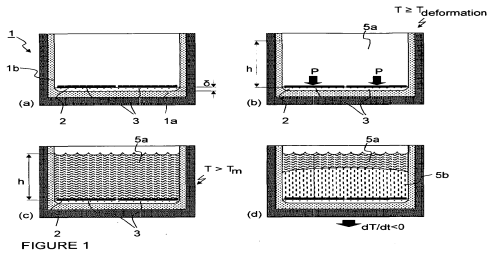


FIGURE 1

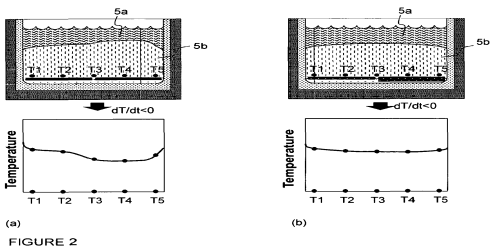


FIGURE 2

GROUP III NITRIDE SEMICONDUCTOR SUBSTRATE AND CLEANING METHOD THEREOF

PROBLEM TO BE SOLVED: To provide a group III nitride semiconductor substrate having a flat face with dangling bond density of more than 14.0 nm<SP>-2</SP>.SOLUTION: A 2 μm (0001) face GaN is grown on a sapphire substrate with a diameter of 2 inches and thickness of 430 μm by an MOCVD method, so as to form a template substrate, and a GaN single crystal with thickness of 5 mm is grown by an HVPE device. A GaN substrate from which a (11-2-2) face is cut out by slicing is wrapped, and processing damage is removed. Thereafter, the substrate is etched with a KOH solution, so as to remove wrapping damage. Then, the substrate is wrapped with a (11-22) face as a top surface, and processing damage due to slicing is removed. Thereafter, the substrate is polished by slurry containing colloidal silica. After the colloidal silica is removed by a cleaning agent containing NH<SB>4</SB>F, the cleaning agent is removed by pure water, and moisture is dried by a spin dryer, so as to obtain the GaN substrate with the (11-22) face as a principal surface.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015061816 A 20150402

Applicant: MITSUBISHI CHEMICALS CORP
Inventor: FUJITO TAKESHI; OTA HIROKI; KUBO SHUICHI
Prio: JP 20070719 2007188603
Appl.No: JP2014220264
IPC: C30B 29/38 2006.01 (IA)

(19) JAPANESE PATENT OFFICE

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(62) Division of application: 2013161647

(71) Applicant: MITSUBISHI CHEMICALS CORP
(72) Inventor: FUJITO TAKESHI
OTA HIROKI
KUBO SHUICHI

(54) GROUP III NITRIDE SEMICONDUCTOR SUBSTRATE AND CLEANING METHOD THEREOF

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a group III nitride semiconductor substrate having a flat face with dangling bond density of more than 14.0 nm-2.

SOLUTION: A 2 μm (0001) face GaN is grown on a sapphire substrate with a diameter of 2 inches and thickness of 430 μm by an MOCVD method, so as to form a template substrate, and a GaN single crystal with thickness of 5 mm is grown by an HVPE device. A GaN substrate from which a (11-2-2) face is cut out by slicing is wrapped, and processing damage is removed. Thereafter, the substrate is etched with a KOH solution, so as to remove wrapping damage. Then, the substrate is wrapped with a (11-22) face as a top surface, and processing damage due to slicing is removed. Thereafter, the substrate is polished by slurry containing colloidal silica. After the colloidal silica is removed by a cleaning agent containing NH_4F, the cleaning agent is removed by pure water, and moisture is dried by a spin dryer, so as to obtain the GaN substrate with the (11-22) face as a principal surface.

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DISLOCATION REDUCTION IN NON-POLAR GALLIUM NITRIDE THIN FILM

PROBLEM TO BE SOLVED: To provide a lateral epitaxial overgrowth (LEO) method to decrease the threading dislocation density of a non-polar a-plane gallium nitride thin film.SOLUTION: The LEO method includes (a) a step 102 of depositing a dielectric regrowth mask on a non-polar a-plane gallium nitride thin film, (b) a step 104 of patterning the deposited mask, and (c) a step 110 of performing selective regrowth 108, and achieving overgrowth based on the patterned mask. In the method, the non-polar a-plane gallium nitride thin film may comprise a seed layer.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015061818 A 20150402

Applicant: REGENTS OF THE UNIV OF CALIFORNIA
Inventor: CRAVEN MICHAEL D; DENBAARS STEVEN P; SPECK JAMES S
Prio: US 20020415 2002 372909
Appl.No: JP2014224170
IPC: C30B 29/38 2006.01 (IA)

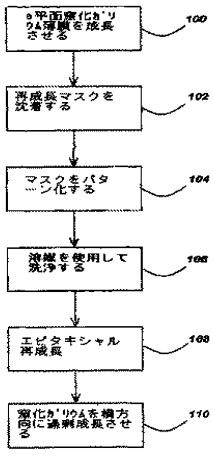

FIG. 1

SILICON CARBIDE SEMICONDUCTOR SUBSTRATE, AND SILICON CARBIDE SEMICONDUCTOR DEVICE WITH SILICON CARBIDE SEMICONDUCTOR SUBSTRATE

PROBLEM TO BE SOLVED: To provide a silicon carbide semiconductor substrate and a silicon carbide semiconductor device with a silicon carbide semiconductor substrate, the substrate and device being capable of suppressing warp.SOLUTION: A silicon carbide semiconductor substrate 10 includes a first principal plane 10a and a second principal plane 10b opposite to the first principal plane 10a, and contains nitrogen as impurity. A ratio in which a thickness d of the silicon carbide semiconductor substrate 10 is divided by a maximum diameter 2R of the first principal plane 10a is 4x10<SP>-3</SP> or less, and the concentration of nitrogen is 1x10<SP>18</SP> cm<SP>-3</SP> or more.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015063429 A 20150409

Applicant: SUMITOMO ELECTRIC IND LTD
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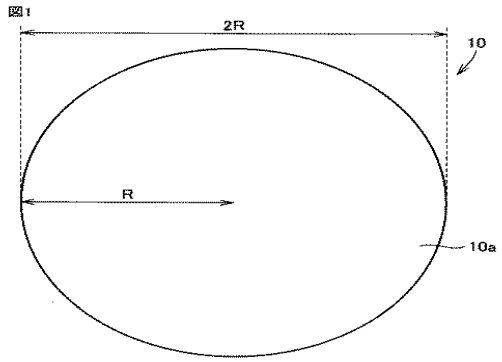
Prio:
Appl.No: JP2013198352
IPC: C30B 29/36 2006.01 (IA)



METHOD OF MANUFACTURING SINGLE-CRYSTAL INGOT, METHOD OF MANUFACTURING SINGLE-CRYSTAL SUBSTRATE, AND METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

PROBLEM TO BE SOLVED: To provide a single-crystal ingot which has less crystal defects.SOLUTION: A first single-crystal ingot 12 is grown on a first seed crystal 11 provided with a first plane PL1 perpendicular to a {0001} plane. A second seed crystal 21 provided with a second plane PL2 having an off angle of less than 10° from the {0001} plane is cut out of the first single-crystal ingot 12. The process of growing the first single-crystal ingot 12 is so carried out that variation in <0001> orientation of the second seed crystal 21 in a range of 10 mm square of the second plane PL2 is less than 0.15°. A second single-crystal ingot 22 is grown on the second seed crystal 21.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015063435 A 20150409

Applicant: MITSUBISHI ELECTRIC CORP
Inventor: KOSHO TOMOAKI; SUZUKI HIROYOSHI
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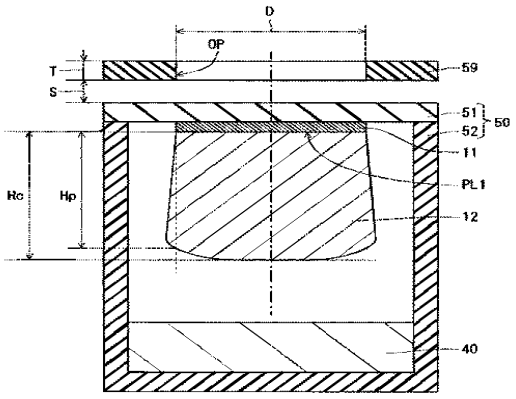
Appl.No: JP2013199567
IPC: C30B 29/36 2006.01 (IA)



SAPPHIRE MEMBER AND MANUFACTURING METHOD OF SAPPHIRE MEMBER

PROBLEM TO BE SOLVED: To provide a sapphire member which provides little scattering of transmission light and allows a status of an observation target arranged in an opposite side to relatively clearly be observed visibly.SOLUTION: Provided is a sapphire member which has a main component of sapphire, and a surface region which has an arithmetic average roughness Ra of 0.1 μm or more, and an average length of a roughness curve element Rsm of 7 μm or more, and provided is a manufacturing method of the sapphire member includes steps of: heating a basic member with a sapphire main component to 1800°C-2000°C; and decreasing a temperature to room temperature for six hours or more after the heating step.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015063441 A 20150409

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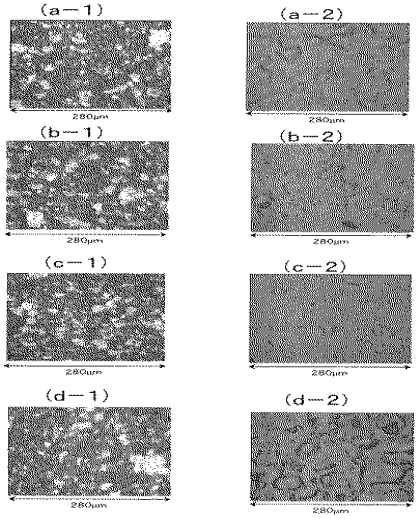
Prio: JP 20130831 2013180773
Appl.No: JP2014111139
IPC: C30B 29/20 2006.01 (IA)

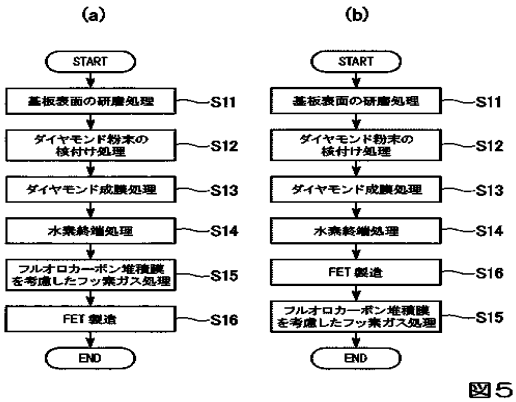


SURFACE TREATMENT METHOD OF DIAMOND THIN FILM, MANUFACTURING METHOD OF FIELD EFFECT TRANSISTOR, AND SENSOR ELEMENT

PROBLEM TO BE SOLVED: To provide a surface treatment method of a diamond thin film, which can provide a diamond surface with a desired property by controlling presence or absence of fluorocarbon deposition film.SOLUTION: A surface treatment method of a diamond thin film according to the present invention includes, depending on a surface property of the diamond thin film, either one of treatments of a first substitution treatment in which a part of hydrogen-termination of the diamond thin film is substituted by fluorine-termination without depositing fluorocarbon deposition film on a diamond thin film surface or a second treatment in which part of hydrogen-termination of the diamond thin film is substituted by the fluorine-termination while the fluorocarbon deposition film is deposited on the diamond thin film surface (process S15).COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015063443 A 20150409

Applicant: YOKOGAWA ELECTRIC CORP; WASEDA UNIV
Inventor: SHINTANI YUKIHIRO; SARUTANI TOSHIYUKI; KAWARADA HIROSHI
Prio: JP 20130826 2013175059
Appl.No: JP2014138972
IPC: C30B 29/04 2006.01 (IA)



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METHOD FOR HETERO EPITAXIAL GROWTH ON HIGH-QUALITY N-FACE GaN, InT, AND AlN AND ALLOY THEREOF BY ORGANIC METAL CHEMICAL VAPOR DEPOSITION METHOD

PROBLEM TO BE SOLVED: To provide a method for hetero epitaxial growth on a high-quality N-face group III nitride film by a suitable organic metal chemical vapor deposition method (MOCVD).SOLUTION: There is provided a method for N-face GaN film growth including: a step 100 of putting a wrong orientation sapphire substrate in an MOCVD reactor; a step 102 of carrying out annealing at a surface temperature of approximately 1090°C in an H<SB>2</SB> environment; a step 104 of forming a thin AlN layer on sapphire which sets an N-face polarity of growth by nitrogenizing the substrate in NH<SB>3</SB> and H<SB>2</SB> for several seconds at a surface temperature of approximately 980°C; a step 106 of depositing a GaN layer of approximately 20 nm in thickness at an intermediate growth temperature first when starting growing NH<SB>3</SB> and GaN on AlN, and depositing a GaN nucleus formation layer in a growth mode for each step flow or layer; and a step 108 of making NH<SB>3</SB> and trimethyl gallium flow in the reactor and starting growing principal GaN in the GaN nucleus formation layer. Here, SiC or Si can also be used for the substrate.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015063458 A 20150409

Applicant: REGENTS OF THE UNIV OF CALIFORNIA
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Prio: US 20061115 2006 866035, US 20070914 2007 855591
Appl.No: JP2014215011
IPC: C30B 29/38 2006.01 (IA)

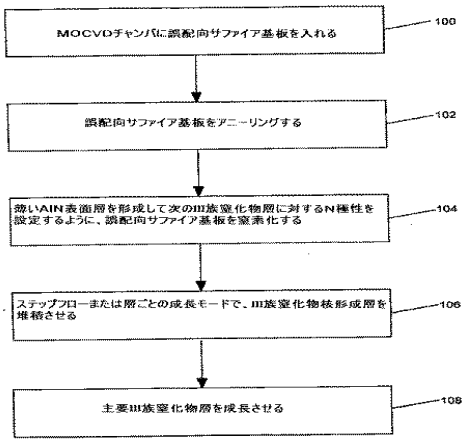

FIG. 1

PRECIPITATION METHOD OF SPECIFIC CRYSTAL FORM BY SUBLIMATION/INVERSE-SUBLIMATION

PROBLEM TO BE SOLVED: To provide a method for acquiring a specific crystal form efficiently and in a higher purity from a chemical compound having a crystal polymorphism.SOLUTION: Provided is a method for sublimating and introducing a chemical compound having two or more crystal polymorphisms into a collection part thereby to precipitate a specific crystal form by an inverse sublimation in the collection part, wherein the collection part is set at a temperature T satisfying the following formula (1): T2≤T≤T1, T1: a precipitation starting temperature by an inverse sublimation of said specific crystal form, and T2: a precipitation starting temperature by an inverse sublimation of a crystal form having a precipitation starting temperature lower than T1. However, there is no crystal form having a precipitation starting temperature between T1 and T2.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015067466 A 20150413

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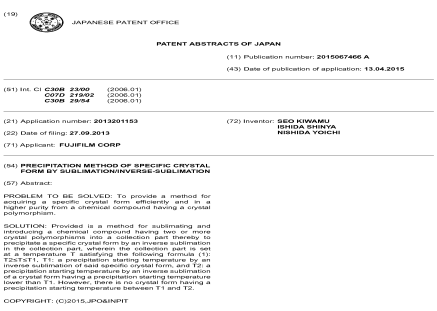
Prio:
Appl.No: JP2013201153
IPC: C30B 23/00 2006.01 (IA)


(19) JAPANESE PATENT OFFICE

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(22) Date of filing: 27.09.2013

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(54) PRECIPITATION METHOD OF SPECIFIC CRYSTAL FORM BY SUBLIMATION/INVERSE-SUBLIMATION

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a method for acquiring a specific crystal form efficiently and in a higher purity from a chemical compound having a crystal polymorphism.

SOLUTION: Provided is a method for sublimating and introducing a chemical compound having two or more crystal polymorphisms into a collection part thereby to precipitate a specific crystal form by an inverse sublimation in the collection part, wherein the collection part is set at a temperature T satisfying the following formula (1): T2≤T≤T1, T1: a precipitation starting temperature by an inverse sublimation of said specific crystal form, and T2: a precipitation starting temperature by an inverse sublimation of a crystal form having a precipitation starting temperature lower than T1. However, there is no crystal form having a precipitation starting temperature between T1 and T2.

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SiC SINGLE CRYSTAL AND METHOD FOR MANUFACTURING THE SAME

PROBLEM TO BE SOLVED: To provide a SiC single crystal having a large growth thickness and without including inclusions, and a method for manufacturing the same.SOLUTION: The SiC single crystal grown by a solution method has the total length M of {1-100} planes in a {0001} growth surface of the SiC single crystal and the length P of the outer periphery of the growth surface of the SiC single crystal satisfying a relationship of M/P≤0.70 and a length of 2 mm in the growth direction of the SiC single crystal. The method for manufacturing the single crystal comprises: contacting a SiC seed crystal substrate with a Si-C solution having a temperature gradient for reducing a temperature from the inside of a crucible toward the surface thereof; and reducing heat removal from a<11-20>direction rather than that from a<1-100>direction. A ratio S/C of the diameter S of the seed crystal substrate to the inner diameter C of the crucible satisfies the relationship of 0.17<S/C<1.0.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015067479 A 20150413

Applicant: TOYOTA MOTOR CORP; NIPPON STEEL & SUMITOMO METAL
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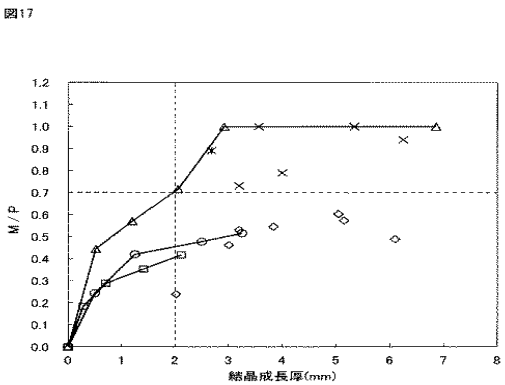
Prio:
Appl.No: JP2013202687
IPC: C30B 29/36 2006.01 (IA)

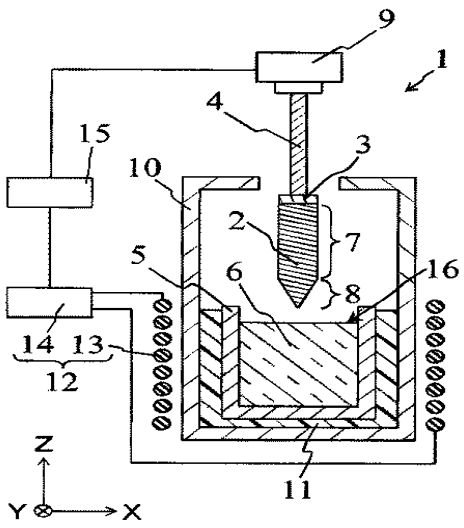


PRODUCTION METHOD FOR CRYSTAL

PROBLEM TO BE SOLVED: To improve quality of a grown crystal.SOLUTION: The crystal production method of the invention, in which a crystal 2 of a silicon carbide is grown on a lower surface of a seed crystal 3 of the silicon carbide, includes: a process for contacting the lower surface of the seed crystal 3 to solution 6 including carbon and silicon; a first growth process for growing a first crystal 7 of the silicon carbide over a liquid surface 16 of the solution 6 on the lower surface of the seed crystal 3 by pulling up the seed crystal 3 contacting the solution 6, and positioning the contact part of the lower surface of the seed crystal 3 and the solution over the liquid surface 16; and a second process for growing a second crystal 8 of the silicon carbide under the liquid surface 16 of the solution 6 from a lower surface of the first crystal 7 by immersing the lower surface of the grown first crystal 7 to the solution 6. At least before the second growth process, a promotion material for promoting crystal growth to under the silicon carbide in the solution 6 is added. Thereby, quality of the grown crystal 2 can be improved.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015067489 A 20150413

Applicant: KYOCERA CORP
Inventor: SHIBATA KAZUYA; MASAKI KATSUAKI; DOMOTO CHIAKI
Prio:
Appl.No: JP2013203024
IPC: C30B 29/36 2006.01 (IA)



SINGLE CRYSTAL MANUFACTURING APPARATUS AND SINGLE CRYSTAL MANUFACTURING METHOD

PROBLEM TO BE SOLVED: To provide a single crystal manufacturing apparatus capable of manufacturing a high-quality single crystal while maintaining a growth surface at high temperature and lowering a degree of supersaturation in the vicinity of the growth surface.SOLUTION: A single crystal manufacturing apparatus 1 comprises: a crucible 21 having a body part 23 which houses a raw material 40 inside and a lid body 24 which seals the body part 23; a seed crystal mounting part 50 capable of mounting a seed crystal 51 so as to face the raw material 40; a coil 30 which heats and sublimates the raw material 40; and a partition member 60 which partitions a space formed in the crucible 21 into a crystal growth space 71 in which a single crystal 52 is allowed to grow on the seed crystal 51 and an ambient space 72 formed outside the crystal growth space 71. The partition member 60 includes a taper end part 62 which is constituted to become gradually smaller as an area of an opening communicating with the crystal growth space 71 as it becomes closer to the raw material 40 housed in the body part 23.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015067499 A 20150413

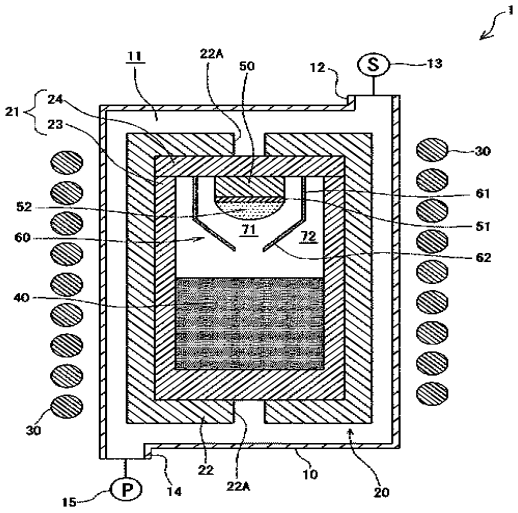
Applicant: FUJIKURA LTD; NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL & TECHNOLOGY

Inventor: HATADA SHINJI; KATO TOMOHISA; MIURA TOMONORI

Prio:

Appl.No: JP2013203532

IPC: C30B 29/38 2006.01 (IA)



METHOD FOR MANUFACTURING SINGLE CRYSTAL DIAMOND

PROBLEM TO BE SOLVED: To provide a single crystal diamond substrate excellent in crystallographic properties of a joint surface.SOLUTION: The method for manufacturing a single crystal diamond substrate comprises the following steps of: (1) placing a plurality of single crystal diamond seed substrates A and B having the same crystallographic properties, and the outer peripheral side surfaces of the main growth surfaces of the seed substrates A and B shaped so that an angle between the off direction and ridge line of each seed substrate A and B is more than 17 degrees and less than 90 degrees, in such a state that both side surfaces of the shaped seed substrates A and B are contacted to each other on a support, the off directions of the crystal planes of the seed substrates A and B are coincident and the main growth surfaces of the seed substrates A and B are exposed; and (2) growing a single crystal diamond on the main growth surfaces of the plurality of seed substrates A and B placed on the support in the (1) step.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015067516 A 20150413

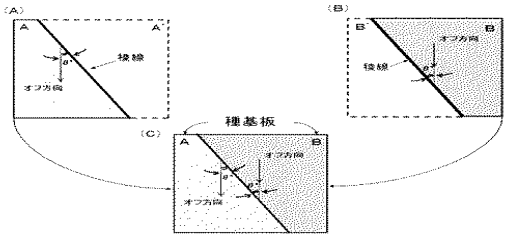
Applicant: NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL & TECHNOLOGY

Inventor: YAMADA HIDEAKI; CHAYAHARA AKIYOSHI; MOKUNO YOSHIAKI

Prio:

Appl.No: JP2013205146

IPC: C30B 29/04 2006.01 (IA)



METHOD FOR MANUFACTURING SINGLE CRYSTAL DIAMOND

PROBLEM TO BE SOLVED: To provide a single crystal diamond substrate, which is obtained by using a plurality of single crystal diamond substrates as raw materials and joining them on the side surfaces thereof having a length of more than 20 mm.SOLUTION: The method for manufacturing a single crystal diamond substrate comprises the following steps of: (1) placing a plurality of single crystal diamond seed substrates having the same crystallographic properties, the outer peripheral side surface of the main growth surface of the seed substrate shaped so that an angle between a ridge line and off direction of the seed substrate is the same among the seed substrates and the ridge line having a length of more than 20 mm on the shaped side surface, in such a state that both side surfaces of the shaped seed substrates in the longitudinal direction are contacted to each other on a support, the off directions of the seed substrates are coincident respectively and the main growth surfaces of the seed substrates are exposed; and (2) growing a single crystal diamond on the main growth surfaces of the plurality of seed substrates placed on the support in the (1) step to join the plurality of seed substrates.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015067517 A 20150413

Applicant: NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL & TECHNOLOGY

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Prio:

Appl.No: JP2013205154

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(22) Date of filing: 30.09.2013

(71) Applicant: NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL & TECHNOLOGY

(72) Inventor: YAMADA HIDEAKI
CHAYAHARA AKIYOSHI
MOKUNO YOSHIAKI

(54) METHOD FOR MANUFACTURING SINGLE CRYSTAL DIAMOND

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a single crystal diamond substrate, which is obtained by using a plurality of single crystal diamond substrates as raw materials and joining them on the side surfaces thereof having a length of more than 20 mm.

SOLUTION: The method for manufacturing a single crystal diamond substrate comprises the following steps of: (1) placing a plurality of single crystal diamond seed substrates having the same crystallographic properties, the outer peripheral side surface of the main growth surface of the seed substrate shaped so that an angle between a ridge line and off direction of the seed substrate is the same among the seed substrates and the ridge line having a length of more than 20 mm on the shaped side surface, in such a state that both side surfaces of the shaped seed substrates in the longitudinal direction are contacted to each other on a support, the off directions of the seed substrates are coincident respectively and the main growth surfaces of the seed substrates are exposed; and (2) growing a single crystal diamond on the main growth surfaces of the plurality of seed substrates placed on the support in the (1) step to join the plurality of seed substrates.

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METHOD FOR MANUFACTURING NANOWIRE

PROBLEM TO BE SOLVED: To more easily form high quality nanowires.SOLUTION: The method for manufacturing nanowires comprises the step S101 (the fine particle arrangement step) of arranging catalyst metal fine particles on a substrate. For example, fine particles consisting of Au and having a diameter of approximately 10 nm are arranged on an InP substrate having the plane orientation of the main surface as a (111) B plane; the step S102 (the nanowire growth step) of supplying a raw material gas formed of an organic metal on the substrate having the fine particles arranged to grow nano-wires crystallized from the raw material gas using the fine particles as a catalyst. For example, trimethyl indium and tertiary butyl phosphine are supplied as a raw material gas to form nano-wires consisting of InP. At this time, a gas of (CH<SB>3</SB>)<SB>3</SB>CCl is supplied in addition to the raw material gas.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015067530 A 20150413

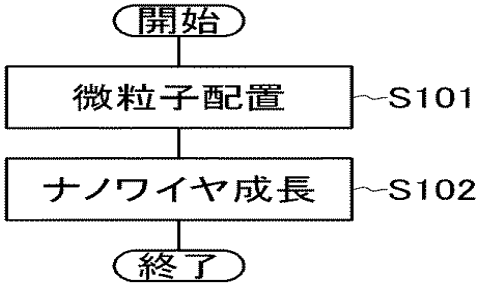
Applicant: NIPPON TELEGR & TELEPH CORP <NTT>

Inventor: TATENO KOTA; SHO KOKUKYO; GOTO HIDEKI

Prio:

Appl.No: JP2013206124

IPC: C30B 29/62 2006.01 (IA)



METHOD FOR PRODUCING TANTALUM NITRIDE

PROBLEM TO BE SOLVED: To provide a method capable of efficiently obtaining a tantalum nitride crystal layer having good crystallinity by a one-step process.SOLUTION: In a method for producing tantalum nitride, a tantalum substrate surface or a tantalum film surface on a substrate is subjected to hydrophilization treatment, the substrate surface or the film surface is coated with a flux aqueous solution or flux paste, and the substrate including the coated surface is heated in a nitrogen source-containing atmosphere, and then cooled to form a tantalum nitride (Ta<SB>3</SB> N<SB>5</SB>) crystal layer on the substrate.COPYRIGHT: (C)2015,JPO&INPIT

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Applicant: SHINSHU UNIV
Inventor: TEJIMA KATSUYA; WAGATA HAJIME; DOMEN KAZUNARI
Prio: JP 20130905 2013184256
Appl.No: JP2014039647
IPC: C30B 29/38 2006.01 (IA)

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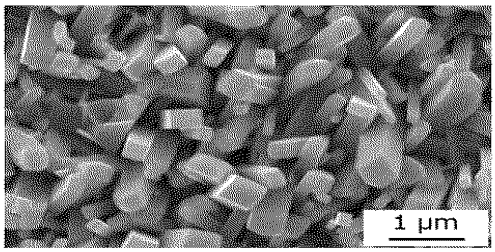

SILICON CARBIDE SINGLE CRYSTAL AND MANUFACTURING METHOD OF SILICON CARBIDE SINGLE CRYSTAL

PROBLEM TO BE SOLVED: To provide a silicon carbide single crystal and a manufacturing method of the silicon carbide single crystal, capable of suppressing cracking of a crystal and occurrence of lamination defects.SOLUTION: A silicon carbide ingot 10 comprises a seed crystal 11 made of silicon carbide, and a silicon carbide layer 13 grown on the surface 11A of the seed crystal 11. The nitrogen concentrations of the seed crystal 11 and the silicon carbide layer 13 are 2x10<SP>19</SP> cm<SP>-3</SP> or less. The nitrogen concentration of a seed crystal neighborhood region 13A or the region containing the boundary portion 14 to the seed crystal 11 in the silicon carbide layer 13 is higher than the nitrogen concentration of the seed crystal 11.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015071527 A 20150416

Applicant: SUMITOMO ELECTRIC IND LTD
Inventor: KAWASE TOMOHIRO; NISHIGUCHI TARO; OI NAOKI; SASAKI MAKOTO; UETA SHUNSAKU; HORI TSUTOMU
Prio: JP 20130909 2013186183
Appl.No: JP2014171614
IPC: C30B 29/36 2006.01 (IA)

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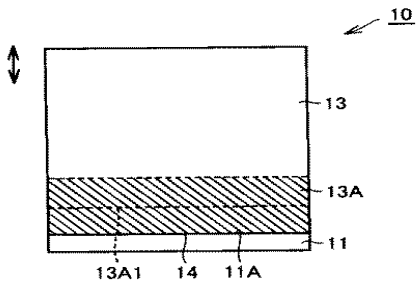
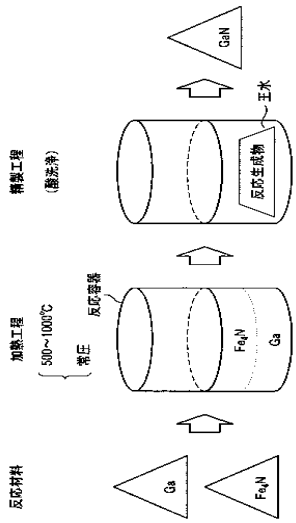


MANUFACTURING METHOD OF GALLIUM NITRIDE CRYSTAL

PROBLEM TO BE SOLVED: To provide a manufacturing method of a gallium nitride crystal, which can produce the gallium nitride crystal in a pressure lower than that in a conventional flux method.SOLUTION: A manufacturing method of gallium nitride includes the steps of: preparing metal gallium and iron nitride containing at least one or more of tetraion mononitride, triiron mononitride, and diiron mononitride as a reaction material; inputting the metal gallium and the iron nitride into a container preferably made of a boron nitride crucible; heating the container up to a reaction temperature of 500 - 1000°C in a nitrogen atmosphere, at which at least the metal gallium and the iron nitride react; holding the temperature for a predetermined time to produce the gallium nitride by producing active nitrogen from a nitrogen atom of the iron nitride or nitrogen molecule which has molten in a melt from atmosphere with a catalytic function of an iron atom of the iron nitride; and separating and purifying a gallium nitride crystal by performing acid cleaning using an acid such as aqua regia in a purification process because a reaction product produced in the heating process generally includes not only the gallium nitride but also gallium oxide, an intermetallic compound of iron and gallium, and the like.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015071529 A 20150416

Applicant: DEXERIALS CORP
Inventor: WATANABE MAKOTO; AKIYAMA SHINYA; MATSUMOTO TATSUYA
Prio: JP 20130909 2013186789
Appl.No: JP2014179571
IPC: C30B 29/38 2006.01 (IA)

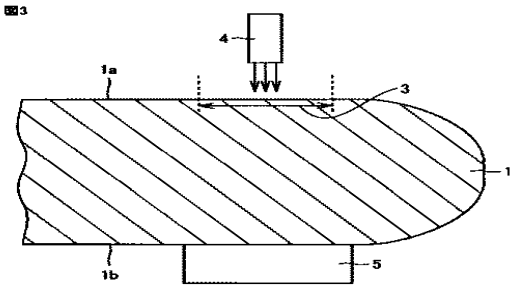


METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

PROBLEM TO BE SOLVED: To provide a method of manufacturing a semiconductor device that can print an identification symbol with good visibility on a semiconductor wafer while suppressing a decrease in manufacturing efficiency.SOLUTION: A method of manufacturing a semiconductor device includes the processes of: preparing a silicon single-crystal wafer 1 where radiation damage is left; and printing on the silicon single-crystal wafer 1 by irradiating a laser print region 3 where radiation damage is left on one main surface 1a of the silicon single-crystal wafer 1 with laser light from a laser light source 4 different from a heater 5 while heating the laser print region 3 by the heater 5.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015074562 A 20150420

Applicant: MITSUBISHI ELECTRIC CORP
Inventor: HIKICHI TOSHIAKI
Prio:
Appl.No: JP2013209295
IPC: C30B 29/06 2006.01 (IA)



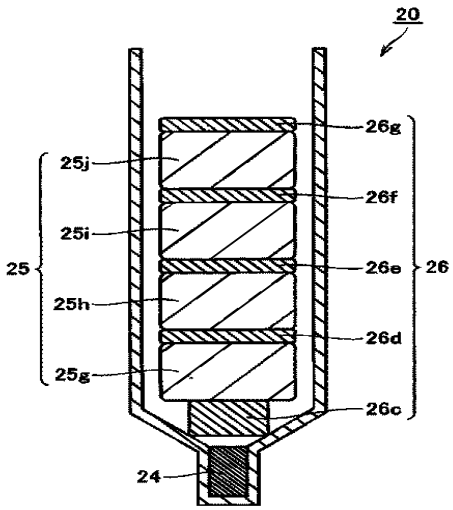
MANUFACTURING METHOD OF SINGLE CRYSTAL

PROBLEM TO BE SOLVED: To provide a manufacturing method of a high quality single crystal using a vertical boat method.SOLUTION: A manufacturing method of a single crystal according to the invention includes the steps of: arranging a seed crystal in a seed crystal housing part of a crucible and arranging a compound semiconductor raw material and boron oxide raw material in a shoulder part and a straight body part of the crucible; producing a boron oxide melt by melting the boron oxide raw material; producing a compound semiconductor melt by melting the compound semiconductor raw material; and growing a single crystal by solidifying the compound semiconductor melt from a seed crystal side to a crucible axial direction. The compound semiconductor raw material and the boron oxide raw material are laminated in the crucible axial direction, and the boron oxide raw material is formed by pressure.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015074568 A 20150420

Applicant: SUMITOMO ELECTRIC IND LTD
Inventor: CHIKAOKA HIRONARI; ISHIKAWA YUKIO; KANEKO SHUICHI; HANEKI YOSHIAKI
Prio:
Appl.No: JP2013210303
IPC: C30B 11/02 2006.01 (IA)

図7

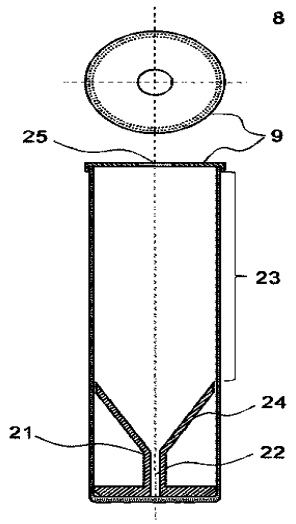


PRODUCTION METHOD OF CERAMIC COMPOSITE MATERIAL FOR PHOTOTRANSFORMATION

PROBLEM TO BE SOLVED: To provide a production method of a ceramic composite material for a phototransformation of a large diameter, which inhibits crack generated from an end solidification side.SOLUTION: Solution accommodated in a pot 8 is unidirectionally solidified by using a vertical type Bridgman device composed of a hot zone and a cool zone, in the production method of the ceramic composite material for phototransformation. The ceramic composite material for phototransformation is a ceramic composite material having organization in which Ln<SB>3</SB>Al<SB>5</SB>O<SB>12</SB>(Ln is at least one element of Y or Tb) phase generated from the solution of the pot at high temperature in one way solidification process, and an Al<SB>2</SB>O<SB>3</SB> phase are contiguously mixed to each other in 3-dimension. It is preferable that the lid 9 has an opening 25 for exhaling a small amount of gas generated from the solution or the pot in high temperature in one way solidification process.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015074569 A 20150420

Applicant: UBE IND LTD
Inventor: TANAKA HISAO; ICHIZONO YASUYUKI; MIYAMOTO NORIFUMI; KONO TAKASHI
Prio:
Appl.No: JP2013210505
IPC: C30B 29/22 2006.01 (IA)



MONOCRYSTAL GROWTH APPARATUS AND MONOCRYSTAL

PROBLEM TO BE SOLVED: To provide a monocrystal growth apparatus which can prevent vaporized material from a molten zone or an upper or lower heating part from adhering to an inner face of an irradiation portion.SOLUTION: A monocrystal growth apparatus includes a pipe body 2 internally containing a sample, and is of a floating molten zone type using light L as a heat source. A gas curtain mechanism which supplies a gas flow along an inner face of the pipe body 2 is provided for an irradiation portion 2a of the pipe body 2 through which the light L passes.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015074579 A 20150420

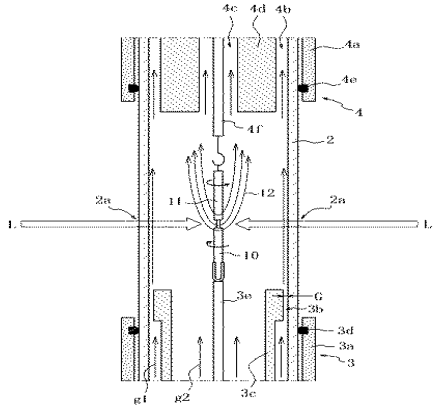
Applicant: CANON MACHINERY INC; INSTITUTE OF PHYSICAL & CHEMICAL RESEARCH

Inventor: NOGUCHI SHUNJI; KANEKO YOSHIO; TOKURA YOSHINORI

Prio:

Appl.No: JP2013211285

IPC: C30B 13/24 2006.01 (IA)



MANUFACTURING METHOD OF SEMICONDUCTOR LAYER OF GROUP III NITRIDE

PROBLEM TO BE SOLVED: To provide a new manufacturing method of a semiconductor layer of a group III nitride having few crystal defects.SOLUTION: A manufacturing method of a semiconductor layer of a group III nitride includes a pit formation step S10 for forming a plurality of funnel-shaped pits that have an oblong pit part extending in the thickness direction of a substrate and a wide pit part having a larger diameter than the oblong pit part on the substrate and linking to an end of the oblong pit part, and link to a dislocation formed on the substrate, and a growth step S20 for growing a group III nitride semiconductor in the transverse direction leaving at least a part of the funnel-shaped pits as a cavity.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015074591 A 20150420

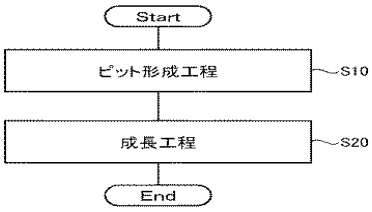
Applicant: FURUKAWA CO LTD

Inventor: SUMIDA YUKITSUNE; NISHIGORI YUTAKA

Prio:

Appl.No: JP2013212913

IPC: C30B 29/38 2006.01 (IA)

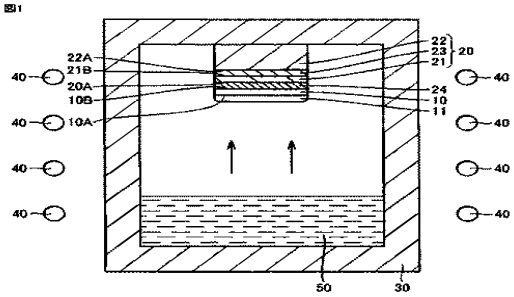


METHOD FOR PRODUCING SILICON CARBIDE SINGLE CRYSTAL

PROBLEM TO BE SOLVED: To provide a method for producing a silicon carbide single crystal having a low basal surface dislocation density.SOLUTION: A method for producing a silicon carbide single crystal includes: a step (S10) of preparing a seed crystal 10 made of silicon carbide; a step (S20) of fixing the seed crystal 10 to a joint surface 20A of a pedestal 20; and a step (S30) of installing the pedestal 20 in a crucible 30 and growing a silicon carbide single crystal 11 on a surface 10A (fourth principal plane) of the seed crystal 10. A value obtained by dividing the radial thermal conductivity, in a direction along the joint surface 20A, of a surface layer 21 including the joint surface 20A in the pedestal 20 by the axial thermal conductivity in a direction vertical to the joint surface 20A is 20 or more.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015074602 A 20150420

Applicant: SUMITOMO ELECTRIC IND LTD
Inventor: UETA SHUNSAKU; HORI TSUTOMU; KAWASE TOMOHIRO
Prio:
Appl.No: JP2013213968
IPC: C30B 29/36 2006.01 (IA)

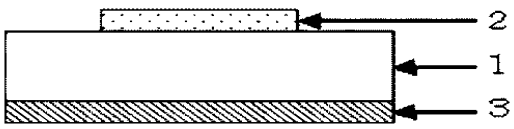


N-TYPE ALUMINUM NITRIDE SINGLE CRYSTAL SUBSTRATE AND VERTICAL NITRIDE SEMICONDUCTOR DEVICE

PROBLEM TO BE SOLVED: To provide a vertical semiconductor diode using an n-type aluminum nitride single crystal substrate in which Si is doped.SOLUTION: In a vertical nitride semiconductor device with ohmic electrode layer on a surface of an n-type aluminum nitride single substrate, a Si content of the n-type aluminum nitride single crystal substrate is 3x10<SP>17</SP> to 1x10<SP>20</SP> cm<SP>-3</SP>, and a dislocation density is 10<SP>6</SP> cm<SP>-3</SP> or less. The ohmic electrode layer is formed at N polar surface side of the n-type aluminum nitride single crystal substrate.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015078076 A 20150423

Applicant: TOKUYAMA CORP
Inventor: KINOSHITA TORU; OBATA TOSHIYUKI; NAGASHIMA TORU
Prio:
Appl.No: JP2013214435
IPC: C30B 29/38 2006.01 (IA)

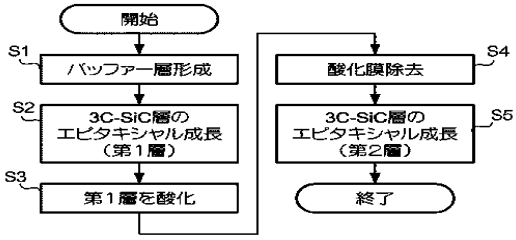


3C-SiC EPITAXIAL LAYER MANUFACTURING METHOD, 3C-SiC EPITAXIAL SUBSTRATE, AND SEMICONDUCTOR DEVICE

PROBLEM TO BE SOLVED: To provide a 3C-SiC epitaxial layer which reduces the warp of a substrate and improves crystal quality.SOLUTION: A 3C-SiC epitaxial layer is manufactured by a manufacturing method including the steps of epitaxial-growing a first 3C-SiC layer on an Si substrate, oxidizing the first 3C-SiC layer, removing an oxide film on a surface of the 3C-SiC layer, and epitaxial-growing, after the removal of the oxide film, a second 3C-SiC layer on the 3C-SiC layer.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015078093 A 20150423

Applicant: SEIKO EPSON CORP
Inventor: WATANABE YUKIMUNE; KAWANA NORIYASU
Prio:
Appl.No: JP2013216306
IPC: C30B 29/36 2006.01 (IA)

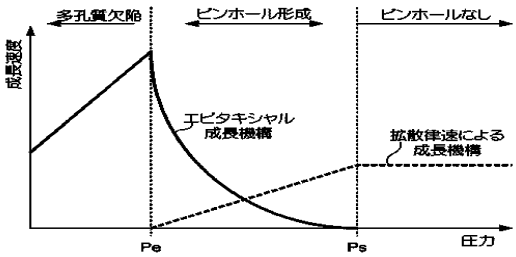


SIC LAYER FORMING METHOD, 3C-SIC EPITAXIAL SUBSTRATE MANUFACTURING METHOD, AND 3C-SIC EPITAXIAL SUBSTRATE

PROBLEM TO BE SOLVED: To form a base char layer having parallel crystal axes, on an Si substrate.SOLUTION: An SiC layer forming method includes the step of carbonizing a surface of an Si substrate by using carbon source gas having a pressure that is lower than a first pressure at which a take-in amount of carbon from a carbon source gas into the Si substrate is saturated, is lower than the equilibrium vapor pressure of a carbonization reaction of the Si substrate by the carbon source gas, and is equal to or more than a second pressure higher than a pressure at which a char layer formed by the carbonization reaction will not have a porous defect.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015078094 A 20150423

Applicant: SEIKO EPSON CORP
Inventor: WATANABE YUKIMUNE
Prio:
Appl.No: JP2013216307
IPC: C30B 29/36 2006.01 (IA)

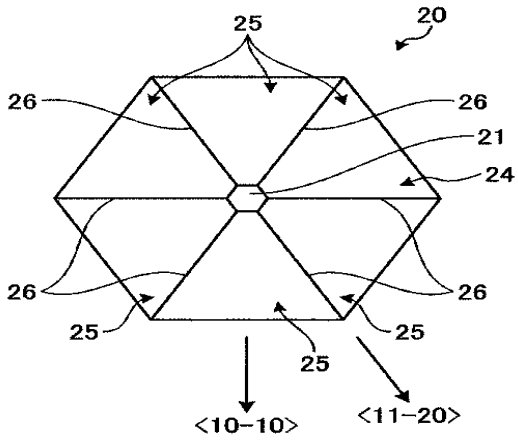


NITRIDE CRYSTAL AND ITS PRODUCTION METHOD

PROBLEM TO BE SOLVED: To provide a nitride crystal and a production method, by which crystal localization and crystal orientation are easily viewed even without performing fabricating process.SOLUTION: In nitride crystal(or a nitride crystal substrate 20 made by slicing thereof) grown by a process for forming mixed solution including alkali metal, group III element and carbon in a range of 0.01 to 5% in a ratio of mol numbers in a reaction vessel, and a process for growing the nitride crystal on a seed crystal 21 by supplying nitrogen to the mixed solution in the reactive vessel with the seed crystal 21 arranged, the nitride crystal grown in an outer circumference of the seed crystal 21 includes a first part region 25 and a growth domain boundary (a second partial region) 26. The second partial region 26 is formed along the crystal orientation from a vicinity of the seed crystal 21 to an outer peripheral of the outer peripheral, and the second partial region 26 is formed along<11-20>direction in a cross section vertical to a c-axis of the nitride crystal.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015078121 A 20150423

Applicant: RICOH CO LTD; OSAKA UNIV
Inventor: SATO TAKASHI; SARAYAMA SHOJI; IWATA HIROKAZU; MORI YUSUKE; KITAOKA YASUO
Prio:
Appl.No: JP2014252213
IPC: C30B 29/38 2006.01 (IA)

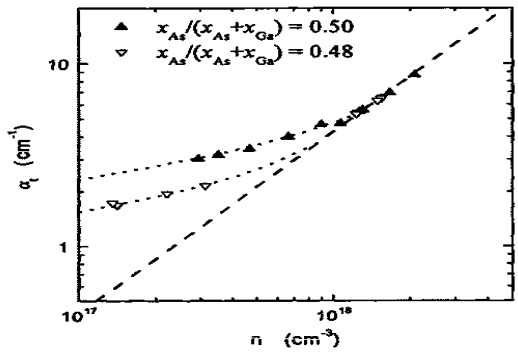


DOPED GALLIUM ARSENIDE SINGLE CRYSTAL HAVING LOW OPTICAL ABSORPTION COEFFICIENT

PROBLEM TO BE SOLVED: To provide a gallium arsenide single crystal having a low optical absorption coefficient.SOLUTION: In the gallium arsenide single crystal, a charge carrier concentration is at least 1x10<SP>16</SP> cm<SP>-3</SP>, and maximum 1x10<SP>18</SP> cm<SP>-3</SP>, and an optical absorption coefficient is maximum 2.5 cm<SP>-1</SP> with a wave length of 1000 nm, maximum 1.8 cm <SP>-1</SP> with a wave length of 1100 nm, and maximum 1.0 cm<SP>-1</SP> with a wave length of 1200 nm. An EL2 concentration is less than 1x10<SP>16</SP> cm<SP>-3</SP>, a boron concentration is at least 5x10<SP>17</SP> cm<SP>-3</SP>, and an etch pit density is no more than 1500 cm<SP>-2</SP> in a cross section vertical to a crystal axis. The crystal is characterized by specifically combining low dislocation density, high conductivity and excellent low optical absorption properties especially in a near infrared ray region.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015078122 A 20150423

Applicant: FREIBERGER COMPOUND MATERIALS GMBH
Inventor: ULRICH KRETZER; FRANK BOERNER; EICHLER STEFAN; FRIEDER KROPFGANS
Prio: DE 20080711 2008 2008032628, US 20080711 2008 079902
Appl.No: JP2015012042
IPC: C30B 29/40 2006.01 (IA)

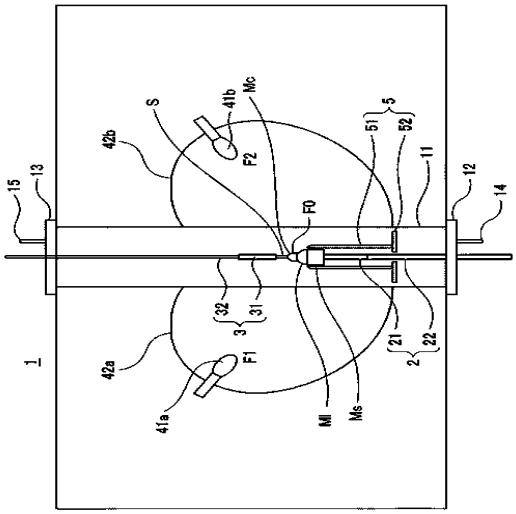


SINGLE CRYSTAL MANUFACTURING APPARATUS, AND SINGLE CRYSTAL MANUFACTURING METHOD

PROBLEM TO BE SOLVED: To provide a single crystal manufacturing apparatus and a single crystal manufacturing method in which a manufacturing cost is significantly reduced by using infrared ray and not using a crucible, and even if a raw material is melted by using infrared ray, a molten raw material is not dripped on a seed crystal and a relatively good-quality single crystal can be easily manufactured.SOLUTION: In a single crystal manufacturing apparatus 1, by bringing a raw material gripping part 2 and a seed crystal gripping part 3 closer to each other after arranging them in a vertical direction, a raw material Ms gripped by the raw material gripping part 2 and a seed crystal S gripped by the seed crystal gripping part 3 are brought closer to each other, the raw material Ms is heated by a heating part, and a molten portion and the seed crystal S are brought into contact with each other to form a molten zone Ml, and a single crystal is manufactured by cooling the molten zone Ml. The heating part has infrared ray generating means 41a, 41b and reflection means (rotating elliptic mirrors) 42a, 42b, the seed crystal gripping part 3 is arranged at a top position in the vertical direction, and the raw material gripping part 2 is arranged at a bottom position in the vertical direction.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015081217 A 20150427

Applicant: AKUTSU SHIN
Inventor: AKUTSU SHIN
Prio:
Appl.No: JP2013220342
IPC: C30B 13/24 2006.01 (IA)

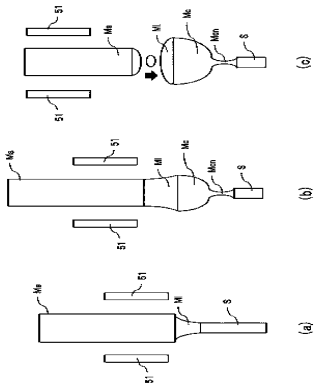


SINGLE CRYSTAL MANUFACTURING APPARATUS AND SINGLE CRYSTAL MANUFACTURING METHOD

PROBLEM TO BE SOLVED: To provide a single crystal manufacturing apparatus and a single crystal manufacturing method which are capable of stable control of a molten zone in crystal growth from a small diameter to a large diameter while employing an FZ (floating zone) method using infrared ray and not using a crucible, and capable of manufacturing a large-diameter and long-sized high-quality single crystal suitable for industrial application.SOLUTION: There is provided a single crystal manufacturing apparatus having a cooling level adjusting part which: includes a shielding cylinder for infrared ray which is freely movable in a vertical direction; freely surrounds at least a part of a raw material gripped by a raw material gripping part by the shielding cylinder in a horizontal direction; and forms a shadow area inside a molten zone by shielding infrared ray irradiated from infrared ray generating means by using the shielding cylinder to adjust a cooling level of the molten zone.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015081218 A 20150427

Applicant: AKUTSU SHIN
Inventor: AKUTSU SHIN
Prio:
Appl.No: JP2013220343



IPC: C30B 13/24 2006.01 (IA)

MANUFACTURING METHOD FOR LTG-BASED SINGLE CRYSTAL

PROBLEM TO BE SOLVED: To provide a manufacturing method that reduces variance in composition of a raised LTG-based single crystal.SOLUTION: There is provided a manufacturing method of manufacturing an LTG-based single crystal by an EFG method using a single crystal manufacturing device (1) including a metal mold (30) which holds a raw material melt at an upper surface part (30a) and a moving mechanism (40) which moves a seed crystal (50). The method includes the steps of: setting a moving speed corresponding to the composition of a desired single crystal by using correspondence relation between a moving speed at which the seed crystal is moved by the moving mechanism and the ratio of a concentration of a constituent element taken in the single crystal to a concentration of a constituent element of the LTG-based single crystal of the raw material melt before the manufacture; and moving the seed crystal by the moving mechanism at the set moving speed while bringing the seed crystal into contact with the raw material melt held at the upper surface part.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015081219 A 20150427

Applicant: CITIZEN HOLDINGS CO LTD; NATIONAL INSTITUTE FOR MATERIALS SCIENCE

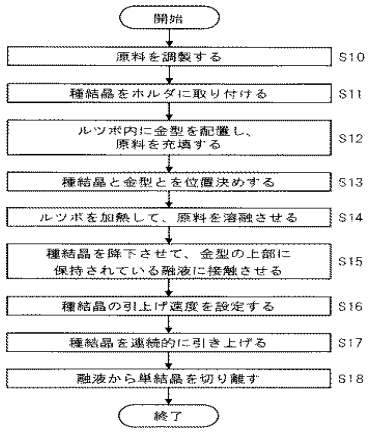
Inventor: KAWASE TOMOKO; SHIMAMURA KIYOSHI; GARCIA VILLORA ENCARNACION ANTONIA

Prio:

Appl.No: JP2013220519

IPC: C30B 29/22 2006.01 (IA)

図3



GROWING METHOD OF SINGLE CRYSTAL

PROBLEM TO BE SOLVED: To provide a growing method of single crystal of Terbium-Gallium-Garnet (TGG) having a garnet structure, which is used in a Faraday rotator for an optical isolator, in which occurrence of is distortion can be suppressed in growing the single crystal by a CZ method (Czochralski method).SOLUTION: There is provided a growing method of a single crystal having a garnet structure, which has a process of drawing up a seed crystal 2 which is brought into contact with raw material molten liquid in a direction of a crystal orientation <111>. The seed crystal 2 is formed in a hexagonal columnar shape in which a crystal plane of side faces 21 is {211} or {110}, and a crystal plane of at least one bottom surface 22 is {111}. Thus, a growth rate of a single crystal on a growth surface which the seed crystal 2 contacts is made uniform over the whole periphery, a single crystal having little distortion is grown, and occurrence of a crack can be suppressed as a result.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015083523 A 20150430

Applicant: FUJIKURA LTD

Inventor: FUNAKI AKIHARU

Prio:

Appl.No: JP2013222295

IPC: C30B 29/28 2006.01 (IA)

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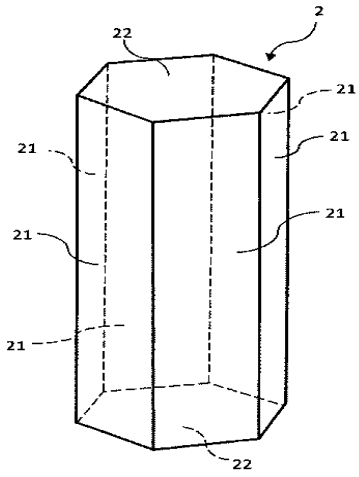
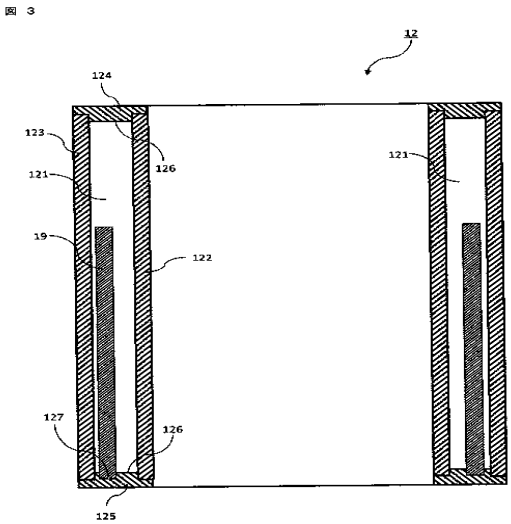


SINGLE CRYSTAL GROWTH APPARATUS

PROBLEM TO BE SOLVED: To provide a single crystal growth apparatus which makes it possible to gently set the temperature gradient of a crucible upper space and has excellent temperature responsiveness.SOLUTION: A single crystal growth apparatus comprises a crucible 11 having conductivity with raw material input into it, induction heating means 14 for induction-heating the crucible, and a nonmagnetic cylindrical structure body 12 provided at the upper part of the crucible, wherein a conductor 19 is provided at a side wall part of the cylindrical structure body 12.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015083524 A 20150430

Applicant: FUJIKURA LTD
Inventor: TAKAHASHI YUKI
Prio:
Appl.No: JP2013222300
IPC: C30B 15/00 2006.01 (IA)

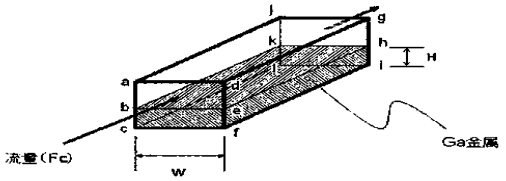


MANUFACTURING METHOD OF CRYSTAL OF GROUP XIII METAL NITRIDE

PROBLEM TO BE SOLVED: To provide a method for enhancing efficiency of raw material utilization and efficiently growing a crystal of a group XIII metal nitride.SOLUTION: In a method for manufacturing a crystal of a group XIII metal nitride, a liquid containing a group XIII metal element is brought into contact with a reactive gas to generate a gas containing the group XIII metal element and a crystal of a group XIII metal nitride is grown by using the generated gas and ammonia. The ratio W/H of width W of a vessel holding the liquid and depth H of the liquid is 0.40 or more.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015083528 A 20150430

Applicant: MITSUBISHI CHEMICALS CORP
Inventor: NAGAOKA HIROFUMI; SAITO TAKEYA; KUBOTA KOHEI
Prio: JP 20130918 2013193268
Appl.No: JP2013232250
IPC: C30B 29/38 2006.01 (IA)

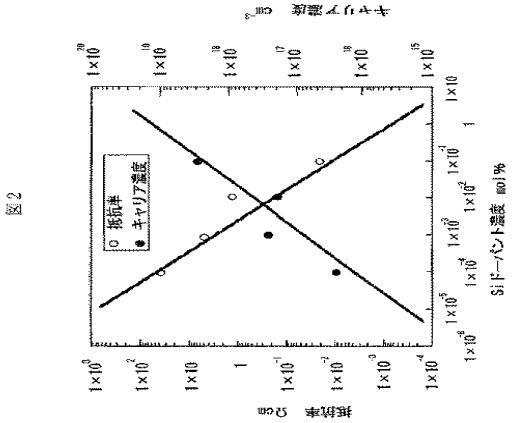


ß-Ga2O3 SINGLE CRYSTAL AND LIGHT-EMITTING DEVICE

PROBLEM TO BE SOLVED: To provide a high insulation ß-Ga<SB>2</SB>O<SB>3</SB> single crystal in which a predetermined resistivity and carrier concentration is controlled, and a light-emitting device.SOLUTION: A ß-Ga<SB>2</SB>O<SB>3</SB> single crystal is formed by a floating zone method using a ß-Ga<SB>2</SB>O<SB>3</SB> seed crystal and a ß-Ga<SB>2</SB>O<SB>3</SB> polycrystal material including Si which is an n-type dopant. In a manufacturing method of forming the n-type ß-Ga<SB>2</SB>O<SB>3</SB> single crystal, concentration of Si included in the polycrystal material is varied to 1x10<SP>-5</SP> to 1 mol% to provide a resistivity of 2.0x10<SP>-3</SP> to 8x10<SP>2</SP> Ωcm and a carrier concentration of 5.5x10<SP>15</SP> to 2.0x10<SP>19</SP>/cm<SP>3</SP>. The single crystal is processed such as cutting to provide a substrate, and a light-emitting device is produced using the substrate.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015083536 A 20150430

Applicant: WASEDA UNIV
Inventor: ICHINOSE NOBORU; SHIMAMURA KIYOSHI; AOKI KAZUO; GARCIA VILLORA ENCARNACION ANTONIA
Prio:
Appl.No: JP2014224158
IPC: C30B 29/16 2006.01 (IA)



METHOD FOR MANUFACTURING SUBSTRATE OF WHICH CARRIER LIFETIME IS IMPROVED

PROBLEM TO BE SOLVED: To provide a method for depositing silicon carbide coating on a substrate so that the obtained coating has a carrier lifetime of 0.5-1,000 μSec.SOLUTION: A method for depositing silicon carbide coating on a substrate includes a step (a) for introducing a mixed gas containing a chlorosilane gas selected from a dichlorosilane gas, a methylhydrogendichlorosilane gas, a dimethyldichlorosilane gas, and a mixture thereof, a gas containing carbon, and a hydrogen gas into a reaction chamber containing a single crystal silicon carbide substrate; and a step (b) for heating the substrate at 1,200-1,800°C. The pressure in the reaction chamber is kept in the range of 10-250 torr.COPYRIGHT: (C)2015,JPO&INPIT

Publication: JP 2015083538 A 20150430

Applicant: DOW CORNING CORP
Inventor: CHUNG GILYONG; LOBODA MARK
Prio: US 20060719 2006 831839
Appl.No: JP2014237430
IPC: C30B 29/36 2006.01 (IA)

(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 2015083538 A
(43) Date of publication of application: 30.04.2015

(51) Int. Cl C30B 29/36 (2006.01)
C23C 16/42 (2006.01)

(21) Application number: 2014237430
(22) Date of filing: 25.11.2014
(30) Priority: 19.07.2006 US 2006 831839
(62) Division of application: 2012231897

(71) Applicant: DOW CORNING CORP
(72) Inventor: CHUNG GILYONG
LOBODA MARK

(54) METHOD FOR MANUFACTURING SUBSTRATE OF WHICH CARRIER LIFETIME IS IMPROVED

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a method for depositing silicon carbide coating on a substrate so that the obtained coating has a carrier lifetime of 0.5-1,000 μSec.

SOLUTION: A method for depositing silicon carbide coating on a substrate includes a step (a) for introducing a mixed gas containing a chlorosilane gas selected from a dichlorosilane gas, a methylhydrogendichlorosilane gas, a dimethyldichlorosilane gas, and a mixture thereof, a gas containing carbon, and a hydrogen gas into a reaction chamber containing a single crystal silicon carbide substrate; and a step (b) for heating the substrate at 1,200-1,800°C. The pressure in the reaction chamber is kept in the range of 10-250 torr.

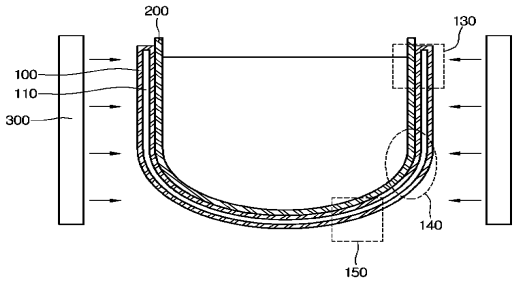
COPYRIGHT: (C)2015,JPO&INPIT

INGOT GROWING APPARATUS

The present invention relates to an ingot growing apparatus, comprising a quartz crucible which stores a silicon melting solution; a graphite crucible which stores the quartz crucible; a crucible rack which supports the lower part of the graphite crucible; a heater part which provides heat for the graphite crucible wherein the graphite crucible has an inner body contacted to the quartz crucible; an outer body installed at a different position of the inner body; and an inert gas layer which is formed between the inner body and the outer body. According to the present invention, the ingot growing apparatus insulates the inside of the crucible in a process of melting poly silicon and accordingly reduces power electricity for heater, and prevents degradation concentration to a certain part on the inside wall of the crucible and accordingly prevents damage caused by degradation, thereby increasing the longevity of the crucible.

Publication: KR 20150033909 A 20150402

Applicant: LG SILTRON INCORPORATED, KR
Inventor: JUNG, HAN SOL, KR; KIM, DO YEON, KR
Prio:
Appl.No: KR1020130113770
IPC: C30B 15/22 2006.01 (IA)

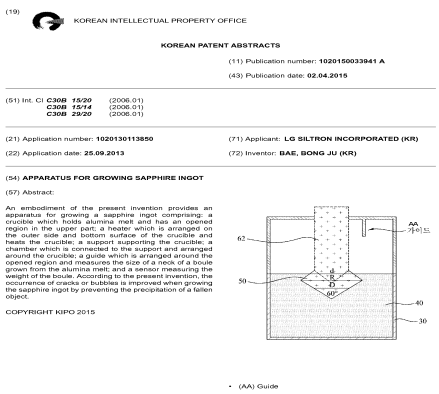


APPARATUS FOR GROWING SAPPHIRE INGOT

An embodiment of the present invention provides an apparatus for growing a sapphire ingot comprising: a crucible which holds alumina melt and has an opened region in the upper part; a heater which is arranged on the outer side and bottom surface of the crucible and heats the crucible; a support supporting the crucible; a chamber which is connected to the support and arranged around the crucible; a guide which is arranged around the opened region and measures the size of a neck of a boule grown from the alumina melt; and a sensor measuring the weight of the boule. According to the present invention, the occurrence of cracks or bubbles is improved when growing the sapphire ingot by preventing the precipitation of a fallen object.

Publication: KR 20150033941 A 20150402

Applicant: LG SILTRON INCORPORATED, KR
Inventor: BAE, BONG JU, KR
Prio:
Appl.No: KR1020130113850
IPC: C30B 15/20 2006.01 (IA)


(19) KOREAN INTELLECTUAL PROPERTY OFFICE

KOREAN PATENT ABSTRACTS

(11) Publication number: 1020150033941 A
(43) Publication date: 02.04.2015

(51) Int. Cl C30B 15/20 (2006.01)
C30B 15/14 (2006.01)
C30B 29/20 (2006.01)

(21) Application number: 1020130113850
(22) Application date: 25.09.2013

(71) Applicant: LG SILTRON INCORPORATED (KR)
(72) Inventor: BAE, BONG JU (KR)

(54) APPARATUS FOR GROWING SAPPHIRE INGOT

(57) Abstract:

An embodiment of the present invention provides an apparatus for growing a sapphire ingot comprising: a crucible which holds alumina melt and has an opened region in the upper part; a heater which is arranged on the outer side and bottom surface of the crucible and heats the crucible; a support supporting the crucible; a chamber which is connected to the support and arranged around the crucible; a guide which is arranged around the opened region and measures the size of a neck of a boule grown from the alumina melt; and a sensor measuring the weight of the boule. According to the present invention, the occurrence of cracks or bubbles is improved when growing the sapphire ingot by preventing the precipitation of a fallen object.

- (AA) Guide

LID FOR INGOT CHAMBER

The present invention is aimed at providing an ingot chamber lid comprising: a lid cover (10) which is arranged in an ingot chamber, in which a place for growing ingots is prepared, and has view ports (30) for checking the ingots grown in the place; and view port shields (40) which are supported by the lid cover (10) to shield the view ports (30). The view port shields (40) are combined with shafts (42) arranged in the lid cover (10) to be rotated so that the view port shields (40) rotate on the shafts (42), and so open and close the view ports (30), and the lid cover (10) comprises at least two view ports (30) and view port shields (40) to shield the respective view ports (30).

Publication: KR 20150034878 A 20150406

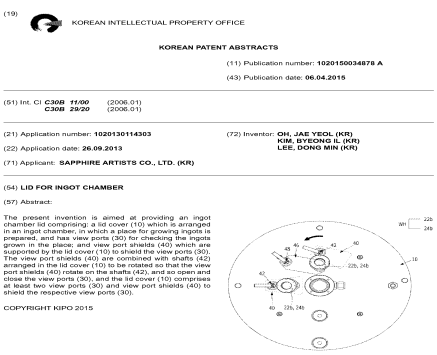
Applicant: SAPPHIRE ARTISTS CO., LTD., KR

Inventor: OH, JAE YEOL, KR; KIM, BYEONG IL, KR; LEE, DONG MIN, KR

Prio:

Appl.No: KR1020130114303

IPC: C30B 11/00 2006.01 (IA)



(19) KOREAN INTELLECTUAL PROPERTY OFFICE

KOREAN PATENT ABSTRACTS

(11) Publication number: 1020150034878 A

(43) Publication date: 06.04.2015

(51) Int. Cl C30B 11/00 (2006.01)
C30B 29/20 (2006.01)

(21) Application number: 1020130114303

(22) Application date: 26.09.2013

(71) Applicant: SAPPHIRE ARTISTS CO., LTD. (KR)

(72) Inventor: OH, JAE YEOL (KR)
KIM, BYEONG IL (KR)
LEE, DONG MIN (KR)

(54) LID FOR INGOT CHAMBER

(57) Abstract:

The present invention is aimed at providing an ingot chamber lid comprising: a lid cover (10) which is arranged in an ingot chamber, in which a place for growing ingots is prepared, and has view ports (30) for checking the ingots grown in the place; and view port shields (40) which are supported by the lid cover (10) to shield the view ports (30). The view port shields (40) are combined with shafts (42) arranged in the lid cover (10) to be rotated so that the view port shields (40) rotate on the shafts (42), and so open and close the view ports (30), and the lid cover (10) comprises at least two view ports (30) and view port shields (40) to shield the respective view ports (30).

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BURNER TRANSFER DEVICE FOR MANUFACTURING QUARTZ GLASS INGOT

The present invention relates to a burner transfer device for manufacturing quartz glass ingot, the device comprising a burner; furnaces; a target plate; burner supporting plates which support the burner; the supporting plates which support the burner supporting plates, wherein the supporting plates are fixated to the sidewalls of the furnaces. As the supporting plates and the burner supported by the supporting plates move, the position of the burner which supplies raw materials in the furnaces is configured to be changed. Thus, the raw materials are capable of being uniformly supplied onto the target plate, thereby manufacturing ingot having not only various sizes but also uniform quality.

Publication: KR 20150035037 A 20150406

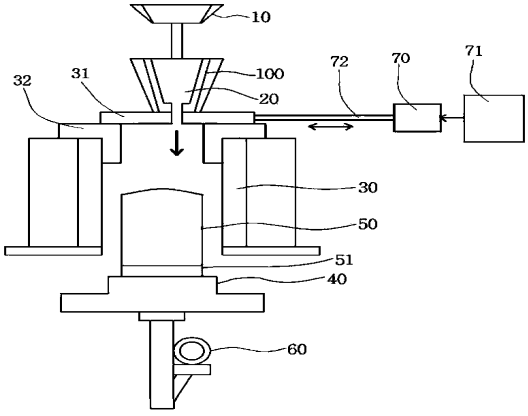
Applicant: DS TECHNO CO., LTD., KR

Inventor: KIM, YOUNG JU, KR; PARK, YOUNG SHIK, KR; SONG, JUN BAEK, KR; JUNG, YOUN WOONG, KR

Prio:

Appl.No: KR1020130115141

IPC: C30B 29/18 2006.01 (IA)



GROWTH PLATE FOR MANUFACTURING QUARTZ GLASS INGOT WITH GROOVES

The present invention relates to a growth plate for manufacturing quartz glass ingot with grooves which has a burner, furnaces, and a growth plate, wherein protuberances and grooves are formed on the upper part of the growth plate, and the grooves have release boundary layer powders. Accordingly, surface melting in the growth plate is easy and loss of the release boundary layer powders is prevented to be capable of reusing. Also, a separation of growth ingot from a lower layer becomes easier, thereby manufacturing ingot having uniform quality.

Publication: KR 20150035281 A 20150406

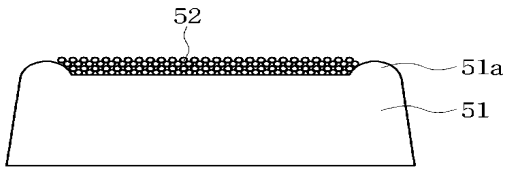
Applicant: DS TECHNO CO., LTD., KR

Inventor: KIM, YOUNG JU, KR; PARK, YOUNG SHIK, KR; SONG, JUN BAEK, KR; JUNG, YOUN WOONG, KR

Prio:

Appl.No: KR1020130115638

IPC: C30B 29/18 2006.01 (IA)



INGOT GROWTH CONTROLLER AND INGOT GROWTH CONTROL METHOD APPLIED TO SAME

The present invention relates to an ingot growth controller which is capable of precisely controlling a diameter of an ingot by reflecting an elevation speed of a crucible which can be varied within a limited range in order to calculate the final growing speed of the ingot and quickly providing right temperature considering the final growing speed of the ingot, and an ingot growth control method applied to the ingot growth controller. According to the ingot growth controller and the ingot growth control method applied to the ingot growth controller, by reflecting the elevation speed of the crucible proportional to the pulling speed of the ingot, which can be varied for diameter deviation value, within the limited range, it is possible to calculate the final pulling speed of the ingot and to precisely control the degree of the variation of the final pulling speed of the ingot. Also, even if the final pulling speed is varied in accordance with a target pulling speed, a precisely calculated heater power is applied to a heater by considering the deviation of the precisely varied final pulling speed, thereby providing the temperature environment where response to the final pulling speed is excellent. Thus, a manufacturing yield of a high quality wafer can be improved and the diameter deviation of the ingot, which can be generated by excessive changes in the temperature where the ingot is growing, can be reduced.

Publication: KR 20150036923 A 20150408

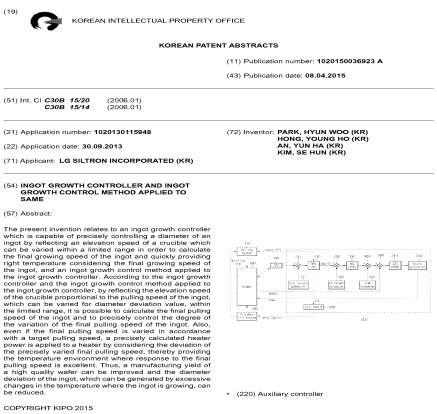
Applicant: LG SILTRON INCORPORATED, KR

Inventor: PARK, HYUN WOO, KR; HONG, YOUNG HO, KR; AN, YUN HA, KR; KIM, SE HUN, KR

Prio:

Appl.No: KR1020130115948

IPC: C30B 15/20 2006.01 (IA)



(19) KOREAN INTELLECTUAL PROPERTY OFFICE

KOREAN PATENT ABSTRACTS

(11) Publication number: 1020150036923 A

(43) Publication date: 08.04.2015

(51) Int. Cl C30B 15/20 (2006.01)
C30B 15/14 (2006.01)

(21) Application number: 1020130115948

(22) Application date: 30.09.2013

(71) Applicant: LG SILTRON INCORPORATED (KR)

(72) Inventor: PARK, HYUN WOO (KR)
HONG, YOUNG HO (KR)
AN, YUN HA (KR)
KIM, SE HUN (KR)

(54) INGOT GROWTH CONTROLLER AND INGOT GROWTH CONTROL METHOD APPLIED TO SAME

(57) Abstract:

The present invention relates to an ingot growth controller which is capable of precisely controlling a diameter of an ingot by reflecting an elevation speed of a crucible which can be varied within a limited range in order to calculate the final growing speed of the ingot and quickly providing right temperature considering the final growing speed of the ingot, and an ingot growth control method applied to the ingot growth controller. According to the ingot growth controller and the ingot growth control method applied to the ingot growth controller, by reflecting the elevation speed of the crucible proportional to the pulling speed of the ingot, which can be varied for diameter deviation value, within the limited range, it is possible to calculate the final pulling speed of the ingot and to precisely control the degree of the variation of the final pulling speed of the ingot. Also, even if the final pulling speed is varied in accordance with a target pulling speed, a precisely calculated heater power is applied to a heater by considering the deviation of the precisely varied final pulling speed, thereby providing the temperature environment where response to the final pulling speed is excellent. Thus, a manufacturing yield of a high quality wafer can be improved and the diameter deviation of the ingot, which can be generated by excessive changes in the temperature where the ingot is growing, can be reduced.

- (220) Auxiliary controller

METHOD FOR GROWING SINGLE CRYSTAL INGOT

A method for growing a single crystal ingot comprises the steps of: growing a single crystal ingot by arranging ZGP of the CUSP magnetic field within a region of top and bottom 10-30 mm based on the central surface of a dissolved solution while passing through a first section when the single crystal ingot is grown while the CUSP magnetic field is applied to the dissolved solution, wherein the dissolved solution is produced by smelting a raw ingredient contained in a crucible; and growing the single crystal ingot by making the position of the ZGP ascend to an upper portion from the position of the ZGP in the first section based on the ascendance of the crucible while passing through a second section, wherein the first section is a section in which the weight of the grown single crystal ingot is less than 40-50% of the total weight of the raw ingredient, the second section is a section in which the weight of the grown single crystal ingot is 40-50% or more of the total weight of the raw ingredient, and the central surface of the dissolved solution is a horizontal surface passing by a point which is 1/2 of the height of the surface of the dissolved solution in the center of the crucible.

Publication: KR 20150042473 A 20150421

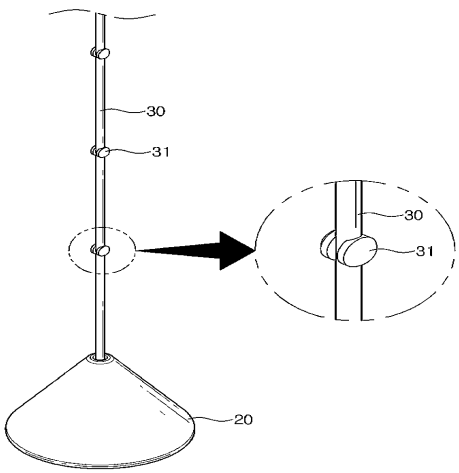
Applicant: LG SILTRON INCORPORATED, KR
Inventor: LEE, JI HYUN, KR
Prio:
Appl.No: KR1020130121164
IPC: C30B 15/20 2006.01 (IA)

RAW MATERIAL SUPPLYING DEVICE FOR SINGLE CRYSTAL SILICONE INGOT GROWING DEVICE

The present invention relates to a raw material supplying device for a single crystal silicone ingot growing device. The raw material supplying device for the single crystal silicone ingot growing device according to the present invention is disposed in an upper portion of a smelting furnace and supplies a lump-type raw material to the smelting furnace. The raw material supplying device for the single crystal silicone ingot growing device comprises: a container-shaped main body including an accommodating space formed therein and having opening portions respectively formed at the top and bottom ends thereof; a lower cover for closing the opening portion at the bottom end of the container-shaped body; and a connection member for connecting the lower cover by passing through the accommodating space in the container-shaped body. A projection is formed to protrude on the side surface of the connection member.

Publication: KR 20150042613 A 20150421

Applicant: SUSUNGTECH CO., LTD., KR
Inventor: YOUN, SOON KWANG, KR
Prio:
Appl.No: KR1020130121485
IPC: C30B 15/02 2006.01 (IA)



APPARATUS FOR GROWING SILICON CARBIDE SINGLE CRYSTAL

The present invention relates to an apparatus for growing silicon carbide single crystal, wherein cooling gas is sprayed toward more than one among a seed crystal connection rod in which silicon carbide single crystal is growing, the upper wall of a crucible, and the surface of a solution. Therefore, the growing speed of silicon carbide single crystal can be increased by increasing the temperature gradient which is the temperature difference between the seed crystal and the inside of the solution, or the circumference of the seed crystal and the inside of the solution.

Publication: KR 20150043691 A 20150423

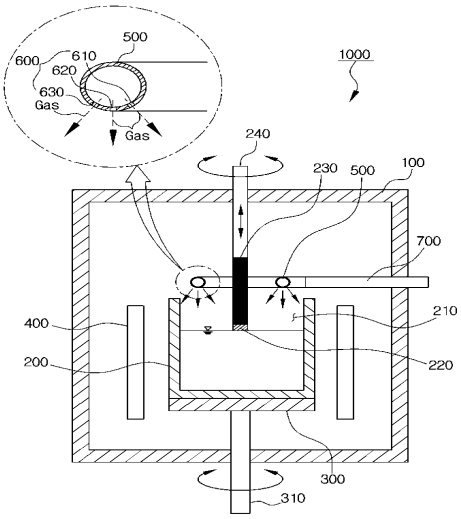
Applicant: SK INNOVATION CO., LTD., KR

Inventor: HONG, SUNG WAN, KR; KIM, YOUNG SHOL, KR; AHN, MIN KI, KR; AN, SUNG JAE, KR

Prio:

Appl.No: KR1020130122378

IPC: C30B 11/00 2006.01 (IA)



DOPING APPARATUS AND DOPING METHOD FOR SINGLE CRYSTAL GROWTH

A doping apparatus for single crystal growth according to an embodiment of the present invention is for growing silicon single crystal from a silicon melt based on the Czochralski method, and comprises a lid unit disposed on an upper part of the central portion of a silicon melt and connected to an upper part of a chamber; and a dopant loading unit coupled to an outer circumferential surface of the lid unit, wherein the lid unit includes a disc-shaped cover unit, and an inclined part having an inclined surface in the center direction from an outer circumferential portion of the cover unit; and the dopant loading unit includes a cylindrical outer portion coupled to the outer circumferential portion of the cover unit, a cylindrical inner portion formed inside the cylindrical outer portion to have a height and a diameter smaller than those of the cylindrical outer portion, and a ring-shaped bottom portion connecting the cylindrical outer portion with a lower end of the cylindrical inner portion.

Publication: KR 101509343 B1 20150407

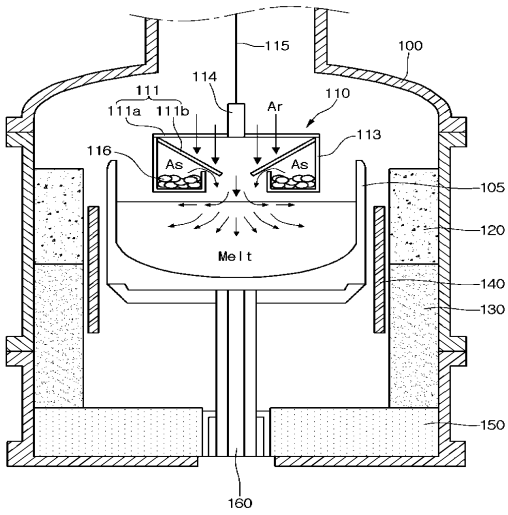
Applicant: LG SILTRON INCORPORATED, KR

Inventor: MOON, CHUL KYU, KR; LEE, SANG JUN, KR; CHOI, YUN HWAN, KR; KONG, JUNG HYUN, KR

Prio:

Appl.No: KR1020130120157

IPC: C30B 15/04 2006.01 (IA)

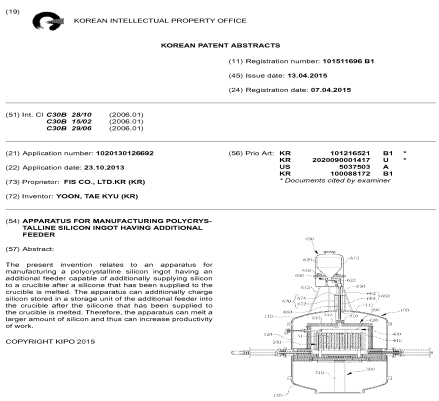


APPARATUS FOR MANUFACTURING POLYCRYSTALLINE SILICON INGOT HAVING ADDITIONAL FEEDER

The present invention relates to an apparatus for manufacturing a polycrystalline silicon ingot having an additional feeder capable of additionally supplying silicon to a crucible after a silicone that has been supplied to the crucible is melted. The apparatus can additionally charge silicon stored in a storage unit of the additional feeder into the crucible after the silicone that has been supplied to the crucible is melted. Therefore, the apparatus can melt a larger amount of silicon and thus can increase productivity of work.

Publication: KR 101511696 B1 20150413

Applicant: FIS CO., LTD., KR
Inventor: YOON, TAE KYU, KR
Prio:
Appl.No: KR1020130126692
IPC: C30B 28/10 2006.01 (IA)



(19) KOREAN INTELLECTUAL PROPERTY OFFICE

KOREAN PATENT ABSTRACTS

(11) Registration number: 101511696 B1
(45) Issue date: 13.04.2015
(24) Registration date: 07.04.2015

(51) Int. Cl C30B 28/10 (2006.01)
C30B 15/02 (2006.01)
C30B 29/06 (2006.01)

(21) Application number: 1020130126692
(22) Application date: 23.10.2013
(73) Proprietor: FIS CO., LTD.KR (KR)
(72) Inventor: YOON, TAE KYU (KR)

(56) Prio Art: KR 101216521 B1 *
KR 20220090001417 U *
US 5037503 A
KR 100088172 B1
* Documents cited by examiner

(54) APPARATUS FOR MANUFACTURING POLYCRYSTALLINE SILICON INGOT HAVING ADDITIONAL FEEDER

(57) Abstract:

The present invention relates to an apparatus for manufacturing a polycrystalline silicon ingot having an additional feeder capable of additionally supplying silicon to a crucible after a silicone that has been supplied to the crucible is melted. The apparatus can additionally charge silicon stored in a storage unit of the additional feeder into the crucible after the silicone that has been supplied to the crucible is melted. Therefore, the apparatus can melt a larger amount of silicon and thus can increase productivity of work.

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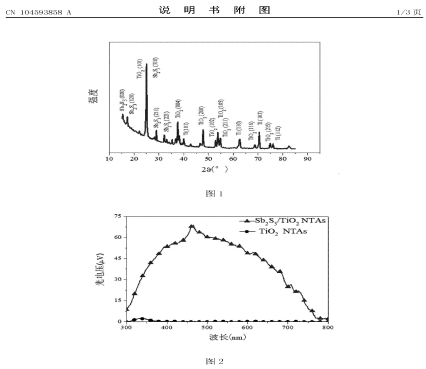
Preparation method of Sb2S3/TiO2 nanotube array composite crystal heterojunction

The invention provides a preparation method for a Sb2S3/TiO2 nanotube array composite crystal heterojunction. According to the method, a highly ordered TiO2 nanotube array is taken as a growth substrate of Sb2S3, Sb2S3 is prepared by a hydrothermal method, and Sb2S3 nano crystals grow in a direction perpendicular to the TiO2 nanotube array to form the unique reinforced-concrete-shaped heterojunction with the TiO2 nanotube array. On one hand, the Sb2S3 nano crystals grow in the direction perpendicular to the TiO2 nanotube array into single crystals, the single crystals have few surface defects, and recombination centers of photon-generated carriers are reduced; on the other hand, the ordered arrangement of the Sb2S3/TiO2 nanotube array composite crystal heterojunction with a unique structure is favorable for transmission and separation of the photon-generated carriers. Meanwhile, the preparation method is short in cycle, low in energy consumption and free of after-treatment, and the cost is greatly reduced. The Sb2S3/TiO2 heterojunction is widely applied to the field of solar cell materials.

Publication: CN 104593858 A 20150506

Applicant: UNIV JIAOTONG SOUTHWEST
Inventor: XI JINFANG; YANG FENG; ZHAO YONG
Prio:
Appl.No: CN201410802642
IPC: C30B 7/14



CN 104593858 A 说 明 书 附 图 1/3 页

图 1

图 2

Overturning clamp for large cover of crystal growing furnace

A related overturning clamp for a large cover of a crystal growing furnace comprises two symmetrically-arranged bracing frames, and fixed ox-horn-shaped members arranged on the bracing frame in a rotation way; each fixed ox-horn-shaped member comprises a rotation shaft, a movable clamping sheet and a bearing block; one end of the rotation shaft is connected with the corresponding bracing frame in a rotation way, and the other end of the rotation shaft is connected with the bearing block; the bearing block and the movable clamping sheet form a fixing area; the large cover is clamped in the fixing area; and two rotation bearings are coaxially arranged. The overturning clamp is capable of effectively controlling the overturning process of the large cover of the jewel furnace, is simple and convenient to operate, helps to effectively solve the problem that the large cover of the sapphire crystal growing furnace is difficult to overturn, helps to effectively improve hoisting, adjusting, cleaning and afresh assembling processes of a thermal field, and helps to greatly shorten the sapphire crystal growth period, improve production power and reduce sapphire crystal growth cost, thereby improving working efficiency, simplifying working process and reducing working risk.

Publication: CN 104593859 A 20150506

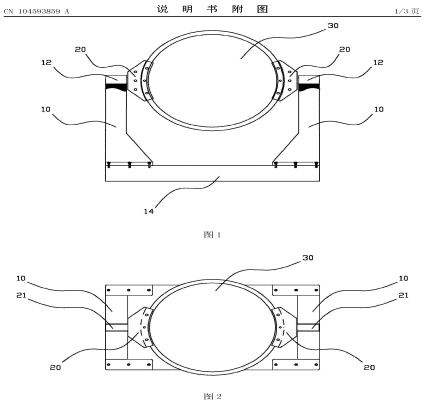
Applicant: FUJIAN XINJING SAPPHIRE TECHNOLOGY CO LTD

Inventor: HUANG XIAOWEI; LIU ZHUPING; YANG MIN; ZHAO HUIBIN

Prio:

Appl.No: CN201410725391

IPC: C30B 11/00



Support structure for VB/VGF single crystal growth and processing method of support structure

The invention discloses a support structure for VB/VGF single crystal growth and a processing method of the support structure. The method comprises the following processing steps: processing an inner wall at one end of a mullite jacket to form a radian; winding a ceramic fiber paper inner core according to the inner diameter of a support pipe, and stuffing into the support pipe; packing the support pipe into an oven to bake; taking out and processing the baked ceramic fiber paper inner core from a quartz support pipe, and packing into a monitoring thermocouple; packing the ceramic fiber paper inner core into the support pipe, and then packing into the mullite jacket; and stuffing small ceramic fiber paper blocks between the mullite jacket and the support pipe to form the support structure for VB/VGF single crystal growth. According to the support structure, the problem that the ceramic fiber paper jacket is easily broken and cracked to affect the stability of the crystal growth process can be effectively solved; the mullite jacket and the inner core of the support structure can be repeatedly used; the repeatability of the crystal growth process is ensured; the production efficiency and the crystal formation rate are effectively improved; and a reliable guarantee is provided for large-scale and massive production.

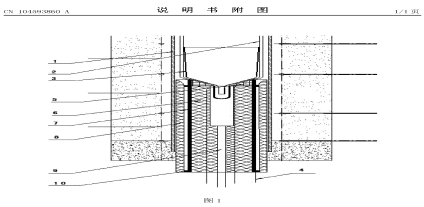
Publication: CN 104593860 A 20150506

Applicant: CHINA ELECTRONICS TECHNOLOGY GROUP CORP NO 46 RES

Inventor: LAN TIANPING; ZHOU CHUNFENG

Prio:

Appl.No: CN201510055342



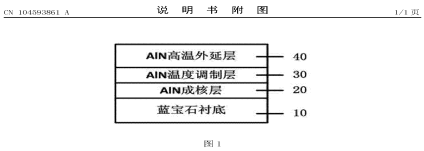
IPC: C30B 11/00

Growth method for improving quality of aluminum nitride film crystal by temperature modulation

The invention discloses a growth method for improving quality of aluminum nitride film crystal by temperature modulation. The growth is carried out in MOCVD equipment and comprises four stages of baking, nucleation, temperature-modulation epitaxial growth and secondary epitaxial growth again. Through an in-situ temperature modulation technology, the growth speed and stress of aluminum nitride are changed by modulating a growth temperature in the epitaxial growth process after an aluminum nitride nucleating layer grows, so that partial dislocation is bent; finally annihilation caused by combination is generated; the dislocation density in an aluminum nitride film is reduced; and the crystal quality is improved. The growth method has the advantages that the method for introducing a temperature modulation layer in the epitaxial growth process of the aluminum nitride material is simple and feasible; the epitaxial material is good in property; and the growth is an effective solving scheme for achieving high-quality epitaxial growth of the aluminum nitride film.

Publication: CN 104593861 A 20150506

Applicant: NO 55 INST CN ELECT SCI & TECH
Inventor: LI LIANG; LI ZHONGHUI; LUO WEIKE
Prio:
Appl.No: CN201510004831
IPC: C30B 25/02



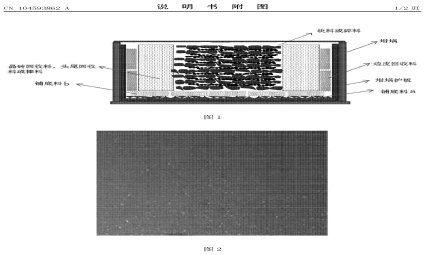
6

Loading method of high-efficiency crucible for producing polycrystalline silicon

The invention provides a loading method of a high-efficiency crucible for producing polycrystalline silicone. The loading method comprises the following steps: (A) selecting a broken silicon material in the size of 3mm to 12mm, pickling the broken silicon material, then rinsing the broken silicon material until no acid remains, drying the silicon material, and packing the silicon material in a splitting manner to obtain a grate-layer material a; selecting a recycled material with the thickness of 3cm to 5cm and the size of 156mm*156mm, placing every five blocks into one package to obtain a grate-layer material b; (B) spraying a layer of grate-layer material a and a grate-layer material b on the bottom of the high-efficiency crucible; (C) laying the leftover recycled material on the periphery of the high-efficiency crucible, stacking a crystal-tile-shaped silicon material and a rod-shaped silicon material at the inner side of the leftover recycled material, and filling a space formed by the crystal-tile recycled material with the blocked silicon material and other smaller silicon materials, and sequentially laying the materials from bottom to top until the loading is ended. The crucible is loaded by utilizing the method, in the ingot casting process, the cold-shock chilling nucleation is not needed, and the high-quality polycrystalline silicon ingots which are uniform and consistent in small grains can be easily obtained.

Publication: CN 104593862 A 20150506

Applicant: YANGZHOU RONGDE NEW ENERGY TECHNOLOGY CO LTD
Inventor: CHANG CHUANBO; FENG YAN; YANG ZHENBANG; YUAN CONG
Prio:
Appl.No: CN201510052075



9

IPC: C30B 28/06

Single-crystal furnace

The invention provides a single-crystal furnace. The single-crystal furnace comprises a furnace body having a furnace cavity, a guide cylinder arranged inside the furnace cavity and a quartz crucible arranged inside the furnace cavity and located below the guide cylinder and also comprises a splash-proof device arranged inside the guide cylinder, wherein the splash-proof device comprises a plurality of protective parts used for protecting the tail end of the guide cylinder and a driving mechanism, the plurality of protective parts are provided with withdrawing positions which are close to one another and protective positions which are far away from one another; and the driving mechanism is connected with the plurality of protective parts in a driving manner to drive the plurality of protective parts to move among the withdrawing positions and the protective positions. By the technical scheme disclosed by the invention, the problem that the service life of a graphite part in the single-crystal furnace is affected by the splashing molten silicon in the prior art can be solved.

Publication: CN 104593863 A 20150506

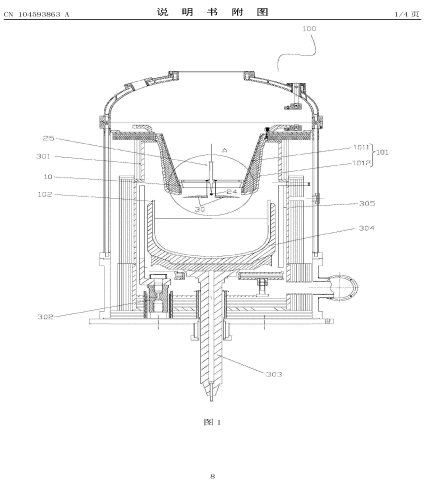
Applicant: BAODING TIANWEI YINGLI NEW ENERGY CO LTD; HEBEI LIUYUN AMPEREX TECHNOLOGY LTD; YINGLI GROUP LTD; YINGLI SOLAR CHINA CO LTD

Inventor: BAI JIANMING

Prio:

Appl.No: CN201510003462

IPC: C30B 29/06



8

Titanium dioxide inverse opals and preparation method thereof

The invention provides a method for preparing titanium dioxide inverse opals. The method comprises the following steps: mixing dihydroxybis(ammonium lactato)titanium(IV), ethanol and hydrochloric acid to prepare a titanium dioxide precursor solution; adding an appropriate amount of the titanium dioxide precursor solution into a colloidal microsphere emulsion; dropwise adding the emulsion to the surface of a substrate which is placed horizontally and is subjected to hydrophilic treatment, and spreading the emulsion to cover the whole surface of the substrate; performing microsphere self-assembly to form colloidal crystals along with the volatilization of a solvent, and meanwhile, drying and curing the titanium dioxide precursor solution to form titanium dioxide filled among microspheres so as to form colloidal crystals filled with titanium dioxide; and finally, removing the microspheres to obtain the titanium dioxide inverse opals.

Publication: CN 104593864 A 20150506

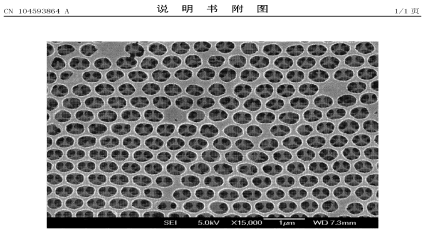
Applicant: UNIV JIANGNAN

Inventor: DENG LIDUO; QI JIAPENG; WANG LIKUI; YAO BOLONG

Prio:

Appl.No: CN201410803878

IPC: C30B 29/16



6

Manufacturing method of silicon carbide base crystal layer

The invention provides a manufacturing method of a silicon carbide base crystal layer. The manufacturing method comprises the following steps: 1, performing crystal pulling in a manner of implanting a crystal seed on the basis of an original silicon wafer manufacturing process; 2, growing a buffer layer or a micro silicon carbide crystal seed containing aluminum silicon nitride or a polycrystalline layer to change the length of a crystal lattice on the surface of the wafer; 3, growing a micro amount of silicon carbide; 4, growing silicon carbide with different characteristic degrees by using different temperatures and different pressures alternately; and 5, annealing. According to the manufacturing method provided by the invention, the silicon wafer is used as a substrate, and the cost is reduced.

Publication: CN 104593865 A 20150506

Applicant: LIAO QIPO; ZHOU WEN
Inventor: LIAO QIPO; ZHOU WEN
Prio:
Appl.No: CN201410825914
IPC: C30B 29/36

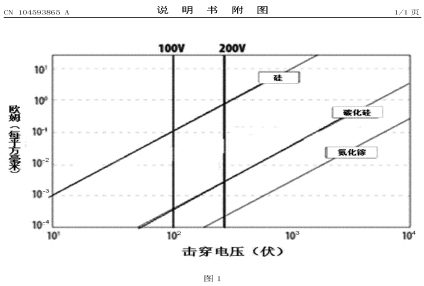


图 1

7

C17H13NO3 nonlinear optical crystal as well as production method and application of crystal

The invention relates to a nonlinear optical crystal having the chemical formula of C17H13NO3 as well as a production method and the application of the crystal. The C17H13NO3 crystal is grown by use of a spontaneous crystallization volatilization method, a cooling method and a seed crystal method; the crystal has the characteristics of high growth speed and low cost, and the crystal large in size and high in quality can be grown easily; the obtained C17H13NO3 crystal has a wide transmission waveband in the range of 0.47-2.2 microns, a great nonlinear optical effect and the powder frequency-doubling effect intensity of 1-2 times OH1, is stable in chemical properties, nondeliquescent and suitable for the requirement of laser frequency conversion in the infrared waveband, and can be applied to manufacturing nonlinear optical devices; at a room temperature, a Ho:Tm: Cr: YAG Q-switched laser device is taken as a light source to output infrared laser having the wavelength of 1045nm with the incident infrared light having the wavelength of 2090nm.

Publication: CN 104593866 A 20150506

Applicant: CHINESE ACAD TECH INST PHYSICS
Inventor: LI YIN; WU YICHENG; YAO JIYONG; ZHANG GUOCHUN; ZHANG XINYUAN
Prio:
Appl.No: CN201510031171
IPC: C30B 29/54

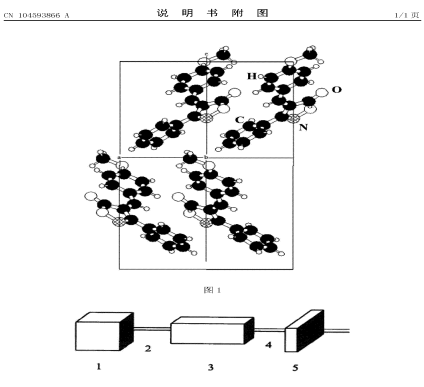


图 1

图 2

9

Method for preparing in-situ modified nano-magnesium hydroxide whiskers by taking phosphate tailings as raw materials

The invention discloses a method for preparing in-situ modified nano-magnesium hydroxide whiskers by taking phosphate tailings as raw materials. The method comprises the following steps: (1) pouring dried phosphate tailings and diluted hydrochloric acid into an acidolysis reactor, performing acidolysis, filtering, removing impurities, thereby obtaining a refined magnesium chloride solution; (2) dripping an alkaline solution under stirring conditions; (3) adding a silane coupling agent and a dispersing agent into the solution in the previous step, and performing aging treatment; and (4) adding the solution in the previous step into an ultrasonic tank, starting a stirrer and ultrasonic equipment, slowly introducing ammonia gas to carry out magnesium precipitation reaction, aging, filtering, washing and drying, thereby obtaining the in-situ modified nano-magnesium hydroxide whiskers. The surface modified nano-magnesium hydroxide whiskers produced by the in-situ modification method have good interface adhesion properties and dispersity in a polymer matrix and can be widely applied to multiple fields of plastics, coatings, environment friendliness and the like.

Publication: CN 104593867 A 20150506

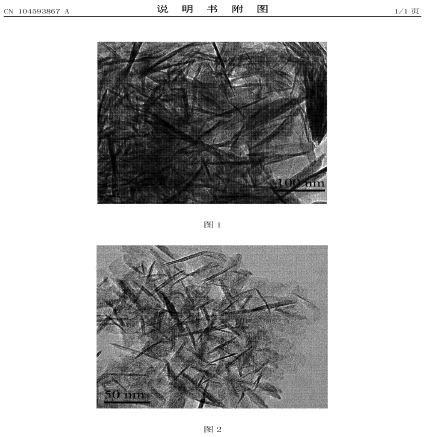
Applicant: HUBEI LIUGUO CHEMICAL INDUSTRY CO LTD; WUHAN INST TECHNOLOGY

Inventor: DENG FULI; DING YIGANG; LIU SHENGPENG; LONG BINGWEN; MENG PEIPEI; SHENG CHANGHE; WU MENG; XU LILI; ZHANG PENG

Prio:

Appl.No: CN201410819904

IPC: C30B 29/62



Method for treating sapphire crystal honeycomb

The invention belongs to the field of crystal growth and in particular relates to a method for treating a sapphire crystal honeycomb. The method is characterized by comprising the following steps: soaking the sapphire crystal honeycomb in a high-temperature mixed solution of concentrated sulfuric acid and hydrogen peroxide for cleaning, soaking the honeycomb in a concentrated hydrochloric acid tank for cleaning, bubbling and cleaning by using nitrogen in a hot purified water tank, and performing ultrasonic cleaning by using purified water; introducing nitrogen protection gas under normal pressure, and baking the sapphire crystal honeycomb at high temperature; performing cold water quenching, cracking and grinding the sapphire crystal honeycomb; and collecting the crystal block at normal pressure, drying in a drying oven for later use. According to a method for cleaning and baking the sapphire honeycomb, the sapphire crystal is recycled, and the problems that the utilization rate is low and the consumption of raw materials is high in the sapphire ingot processing process are solved, so that the production cost is reduced, and the method has a huge commercial value.

Publication: CN 104593868 A 20150506

Applicant: ZHEJIANG EAST CRYSTAL BOLANTE PHOTOELECTRIC CO LTD

Inventor: CHEN SUCHUN; CHI XUMING; JIN LIANGRONG; LI QINGYUE; LIU JIANZHE; WANG ZHEN; WU ZONGZE; ZHENG XIAOLIN

Prio:

Appl.No: CN201410810650

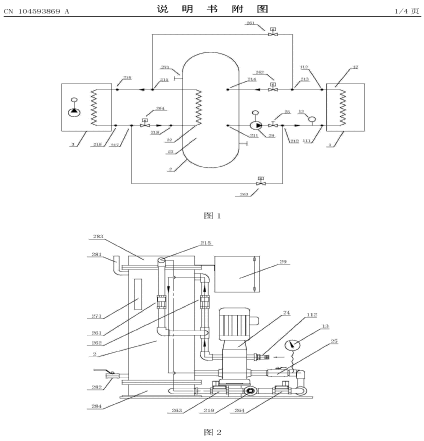
IPC: C30B 33/00

Water circulating device for crystal growing furnace power supply

The invention relates to a water circulating device for a crystal growing furnace power supply. The water circulating device comprises an inner circulating pure water cooling device, an outer circulating water cooling device and a heat exchange device, wherein a communicating vessel of a water path is formed by a water path of the inner circulating pure water cooling device and a water container of the heat exchange device; the water container of the heat exchange device is internally provided with a condenser of an outer circulating water cooling device, and the water path of the condenser and the water container of the heat exchange device are mutually isolated; and a closed inner circulating pure water system is formed by an inner water path, the inner circulating pure water cooling device and the water container of the heat exchange device of the crystal growing furnace power supply, and the water path of the outer circulating water cooling device is a closed outer circulating water system. The water circulating device disclosed by the invention can be widely applied to various types of power supply equipment which are high in requirement for reliability and need to be supplied with water cooling for a long time, such as the crystal growing furnace power supply.

Publication: CN 104593869 A 20150506

Applicant: JIANGSU EASTONE TECHNOLOGY CO LTD
Inventor: LIU YANG; LU WEIGUO
Prio:
Appl.No: CN201510004714
IPC: C30B 35/00



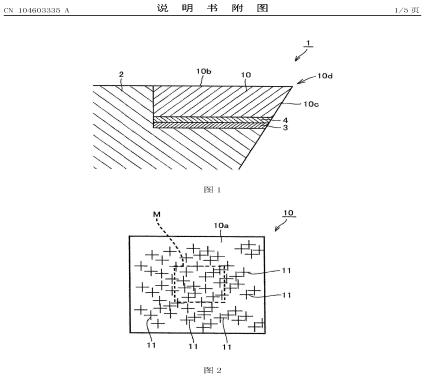
6

SINGLE CRYSTAL DIAMOND AND DIAMOND TOOL

A single crystal diamond (10) is a single crystal diamond into which defect parts (11) have been introduced. The defect parts (11) can be detected by phase differences generated when circularly polarized light illuminates the single crystal diamond (10). In the single crystal diamond (10), the maximum for the average value of the phase difference measured within a measurement region (M) having a square shape in which the length of one side is 1 mm is 30 nm or greater.

Publication: CN 104603335 A 20150506

Applicant: SUMITOMO ELEC HARDMETAL CORP; SUMITOMO ELECTRIC INDUSTRIES
Inventor: KOBAYASHI YUTAKA; NISHIBAYASHI YOSHIKI; SEKI YUICHIRO; SUMIYA HITOSHI; TAKAHASHI TOSHIYA; UEDA AKIHIKO
Prio: JP 20130409 2013081157, JP 20140402 2014059713
Appl.No: CN201480002248
IPC: C30B 29/04



14

Method for producing SiC single crystal

Provided is a method for producing an SiC single crystal, which is capable of greatly increasing the growth rate in a solution technique in comparison to conventional methods. A method for producing an SiC single crystal, wherein an SiC single crystal is grown by bringing a seed crystal substrate into contact with an Si-C solution that is put in a crucible and has a temperature gradient decreasing from the inside to the liquid level, and wherein the value of depth/inner diameter of the crucible is less than 1.71 and the temperature gradient of the Si-C solution from the liquid level to 10 mm below the liquid level is larger than 42 DEG C/cm.

Publication: CN 104603336 A 20150506

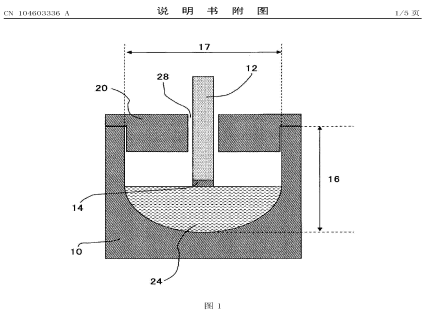
Applicant: NIPPON STEEL & SUMITOMO METAL CORP; TOYOTA MOTOR CO LTD

Inventor: KADO MOTOHISA; KAMEI KAZUHITO; KUSUNOKI KAZUHIKO

Prio: JP 20120830 2012190547, JP 20130812 2013071812

Appl.No: CN201380045663

IPC: C30B 29/36



15

Crack-free colloidal crystal, crack-free inverse colloidal crystal and preparing method of the crack-free colloidal crystal and the crack-free inverse colloidal crystal

The invention provides a method of preparing a crack-free colloidal crystal and a crack-free inverse colloidal crystal through self assembly by adding a proper amount of sodium silicate, potassium silicate or a mixture of the sodium silicate and the potassium silicate into a microsphere emulsion. The method includes following steps of: (1) adding a proper amount of the sodium silicate, the potassium silicate or a mixture of the sodium silicate and the potassium silicate into the colloid microsphere emulsion, and after full dissolution, adding the obtained mixture into a container; (2) inserting a substrate vertically or obliquely into the container; and (3) allowing the container to stand at room temperature or in an oven, and allowing microspheres to perform self-assembly. By addition of the silicate or the sillicates, gaps among the microspheres are filled with silicate hydrolyzates, so that microsphere distance reduction caused by solvent evaporation is effectively inhibited, thus avoiding generation of cracks in colloidal crystal films. The method also includes (4) removing the silicate hydrolyzates among the microspheres through a chemical or physical method to obtain the crack-free colloidal crystal, or removing the microspheres to obtain the crack-free inverse colloidal crystal.

Publication: CN 104611762 A 20150513

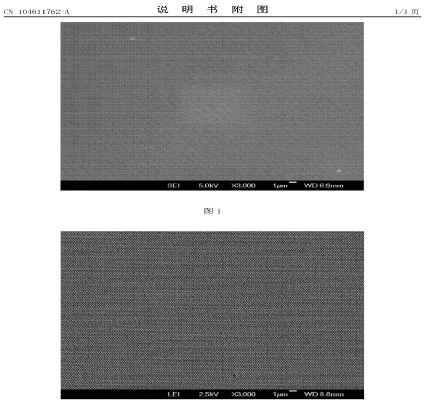
Applicant: UNIV JIANGNAN

Inventor: LIU YUN; QI JIAPENG; WANG LIKUI; YAO BOLONG

Prio:

Appl.No: CN201410797914

IPC: C30B 5/00



6

Technology of using phosphate tailing as raw material to produce in-situ modified nano-magnesium hydroxide whisker

The invention discloses a method of using a phosphate tailing as a raw material to produce an in-situ modified nano-magnesium hydroxide whisker. The method comprises the following steps: pouring the phosphate tailing obtained by flotation and 5-20% of diluted hydrochloric acid into an acid hydrolysis reactor, mixing and stirring uniformly, performing a reaction for a period of time, then filtering, adding the filtrate into an impurity-removing reactor, firstly adding an oxidizing agent to oxidize the filtrate, controlling the pH value, and dropwise adding an alkaline solution to remove the impurities, so as to obtaining a refined magnesium chloride solution; adding a silane coupling agent and a dispersing agent to the solution, and performing ageing treatment; adding the aged solution to an ultrasonic tank, feeding ammonia gas into the ultrasonic tank, then performing a magnesium precipitation reaction, and at last obtaining the surface modified nano-magnesium hydroxide whisker, wherein the filtered alkaline filtrate is rich in free ammonia and can be performed with gas stripping to obtain the ammonia gas, and the ammonia gas is returned to a crystallization section; the liquid phase is crystallized to remove ammonium chloride, and then returned to an acid hydrolysis reaction procedure. The surface modified nano-magnesium hydroxide whisker produced by the in-situ modification method is good in interface adhesion and dispersity in the polymer matrix, and can be widely applied to the fields of plastics, coatings, environment protection and the like.

Publication: CN 104611763 A 20150513

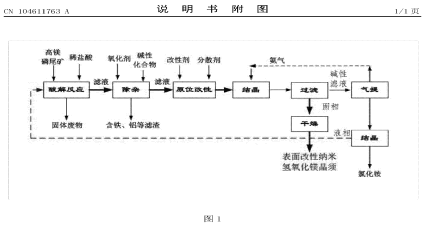
Applicant: HUBEI LIUGUO CHEMICAL INDUSTRY CO LTD; WUHAN INST TECHNOLOGY

Inventor: DENG FULI; DING YIGANG; HUANG PULIN; LI HAOYANG; LIU SHENGPENG; LONG BINGWEN; SHENG CHANGHE; XU LILI

Prio:

Appl.No: CN201410821982

IPC: C30B 7/14



Micro-pulling-down crystal growing furnace

The invention discloses a micro-pulling-down crystal growing furnace. The furnace comprises an upper heat-insulating layer and a bottom heat-insulating layer (13) which are arranged from top to bottom, wherein a tubular observation hole (4) is also formed in the bottom heat-insulating layer (13), and the included angle formed by the central axis of the observation hole (4) and the normal of the top surface of the bottom heat-insulating layer (13) is in a range of 45-60 degrees; each of an inner heat-insulating layer, a middle heat-insulating layer and the bottom heat-insulating layer (13) is formed by pressing and calcining zirconium oxide and aluminium oxide in the mass ratio of 1:9. According to the micro-pulling-down crystal growing furnace, the crystal growing condition of a crystal growing interface can be timely observed via the formed observation hole; besides, the effect caused by the observation hole on the temperature field of the crystal growing furnace is low, and the crystal growing yield can be further increased.

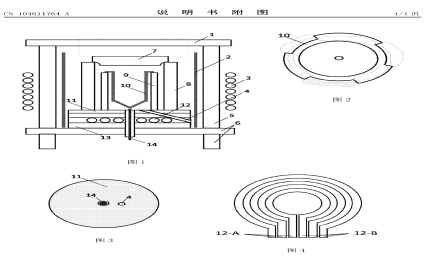
Publication: CN 104611764 A 20150513

Applicant: UNIV HUAZHONG SCIENCE TECH

Inventor: FANG HAISHENG; JIANG ZHIMIN; LIU SHENG; WANG MENGYING; ZHANG ZHOU

Prio:

Appl.No: CN201510029789



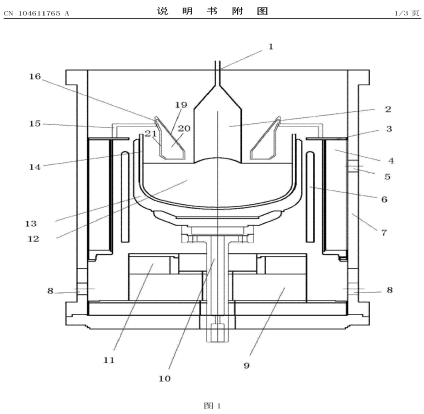
IPC: C30B 15/00

Seed crystal chuck assembly

The invention provides a seed crystal chuck assembly, which comprises a flexible shaft, a coupling rod and a seed crystal chuck, the coupling rod is composed of an upper coupling rod, a drop-proof block and a lower coupling rod, a circle bench is arranged at top of the upper coupling rod, a groove part is arranged along the central axis of the upper coupling rod and arranged on the side surface of the upper coupling rod, the groove part and a lower structure of the flexible shaft are matched; the drop-proof block is sleeved on the circle bench, an opening groove capable of being penetrated by the flexible shaft is arranged at the side surface, a block matched with the groove part of the upper coupling rod is arranged; and the lower coupling rod is connected to the seed crystal chuck through a pin. The seed crystal chuck assembly is used for seed crystal connection in a czochralski silicon crystal growing furnace, when the seed crystal chuck is replaced, rapid connection of the seed crystal chuck and the lower end of the flexible shaft can be realized in a simple and fast mode without disconnection from the flexible shaft, assembling time is shortened, and production efficiency of a silicon single-crystal rod is increased.

Publication: CN 104611765 A 20150513

Applicant: GRINM ADVANCED MATERIALS CO LTD
Inventor: CUI BIN; DAI XIAOLIN; HAN QIUYU; JIANG JIAN; WANG YA NAN; WU ZHIQIANG
Prio:
Appl.No: CN201310542301
IPC: C30B 15/32

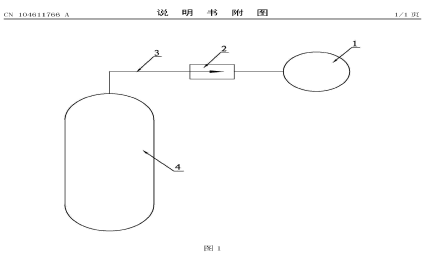


Polycrystalline ingot furnace oil return prevention device and using method thereof

The invention discloses a polycrystalline ingot furnace oil return prevention device which comprises a vacuum pump, a check valve, an exhaust tube and an ingot furnace, wherein the vacuum pump is communicated with the ingot furnace through the exhaust tube; the check valve is mounted on the exhaust tube between the vacuum pump and the ingot furnace; the vacuum pump is used for exhausting the gas in the ingot furnace through the exhaust tube and the check valve. By adopting the polycrystalline ingot furnace oil return prevention device, the outside gas cannot flow back through the exhaust tube when the vacuum pump has fault and the mechanical oil in the vacuum pump cannot flow back into the ingot furnace through the exhaust tube, so that the mechanical oil is prevented from polluting the crystal ingot, the heater and the like in the ingot furnace chamber, vast cost is saved for a factory and no influence is caused to the production.

Publication: CN 104611766 A 20150513

Applicant: GUODIAN ZHAOJING OPTOELECTRONICS TECHNOLOGY JIANGSU CO LTD
Inventor: JI XIAOJUN; LIU RONGJIAN; LYU JIANMING; SUN DONG; TAN JUN
Prio:
Appl.No: CN201510048109
IPC: C30B 28/06



Dual-pipeline switching gas-filling device of polycrystalline ingot furnace and control method thereof

The invention provides a dual-pipeline switching gas-filling device of a polycrystalline ingot furnace and a control method thereof. The dual-pipeline switching gas-filling device comprises a first hand valve, a first hand valve, a third hand valve, a first flowmeter, a fourth hand valve, a fifth hand valve, a second flowmeter, a main gas channel and an auxiliary gas channel; the first hand valve, the second hand valve and the third hand valve as well as the first flowmeter are connected in series and mounted on the main gas channel; one end of the main gas channel is communicated with an argon tank, while the other end of the main gas channel is communicated with the ingot furnace; the fourth hand valve, the fifth hand valve and the second flowmeter are connected in series and mounted on the auxiliary gas channel; one end of the auxiliary gas channel is connected to the main gas channel between the first hand valve and the second hand valve, while the other end of the auxiliary gas channel is connected to the main gas channel between the third hand valve and the ingot furnace. The dual-pipeline intake switching pressure-maintaining device is adopted, and capable of automatically switching the auxiliary gas channel to supply gas into the ingot furnace, and no influence is caused on the production.

Publication: CN 104611767 A 20150513

Applicant: GUODIAN ZHAOJING OPTOELECTRONICS TECHNOLOGY JIANGSU CO LTD

Inventor: JI XIAOJUN; LIU RONGJIAN; MEI JIANHUA; SUN DONG; WANG DEMING

Prio:

Appl.No: CN201510048124

IPC: C30B 28/06

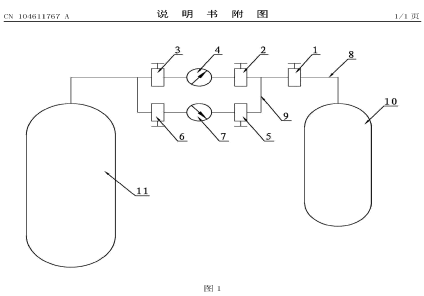


图 1

Method for preparing mesoporous monocrystal TiO2 through ultrasonic spray drying

The invention discloses a method for preparing mesoporous monocrystal TiO2 through ultrasonic spray drying. The method comprises the following steps: firstly, preparing a precursor solution at a room temperature: mixing a titanic precursor, ammonium nitrate, a surface active agent or an organic polymer, and water in the mole ratio of 1: (0.5-50): (0-500): (30-5000); then, transferring the precursor solution in an ultrasonic spray drying device for atomizing, and controlling the atomizing temperature to be 100-800 DEG C, and collecting to obtain the mesoporous monocrystal TiO2. The mesoporous monocrystal TiO2 prepared through the method has the advantages of good sample dispersibility, short reaction time, high product purity, simple process, high convenience in operation and the like. The method is applicable to large-scale industrial production.

Publication: CN 104611768 A 20150513

Applicant: UNIV SHANGHAI

Inventor: BIAN ZHENFENG; CAO FENGLEI; LI HEXING; TANG CHAO

Prio:

Appl.No: CN201410851401

IPC: C30B 29/16

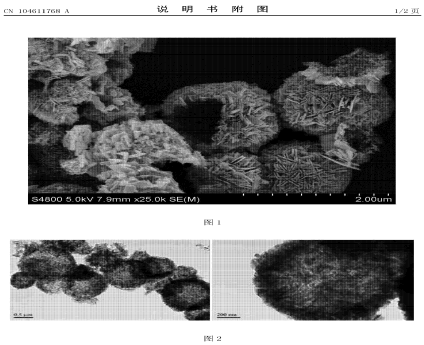


图 1

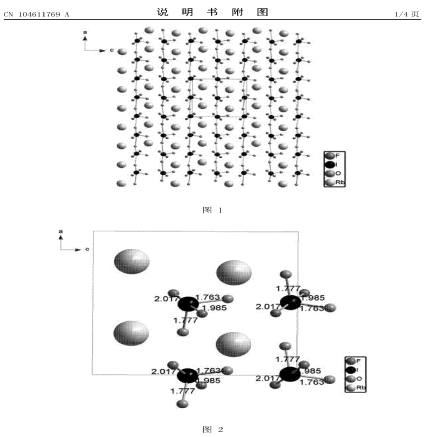
图 2

Intermediate infrared nonlinear optical crystal material RbIO2F2 as well as preparation method and application of crystal material

The invention discloses an intermediate infrared nonlinear optical crystal material having the chemical formula of RbIO2F2. The crystallographic space group of the material is Pca21 and the cell parameters are as follows: a=8.567(4) angstroms, b=6.151(3) angstroms, c=8.652(4) angstroms, alpha=beta=gamma=90 degrees, and z=4. The invention also provides a hydrothermal preparation method of the crystal material. The intermediate infrared nonlinear optical crystal material prepared has a quite strong phase-matching second harmonic generation (SHG); the result of a Kurtz powder SHG test indicates that the powder SHG of the crystal material is four times that of potassium dihydrogen phosphate (KDP); the laser-damagedthreshold of the crystal material is at least 700MW/cm<2>, which is more than 23 times the laser-damagedthreshold of the existing commercial intermediate infrared nonlinear optical crystal material AgGaS2; the crystal material has a relatively wide transmission range within the visible region and the intermediate infrared region, and the complete transmission waveband is 0.29-12 microns; the crystal material contains no crystal water, and is stable in air and good in thermal stability; in addition, a single crystal material can be prepared by use of a simple solvent evaporation method.

Publication: CN 104611769 A 20150513

Applicant: UNIV WUHAN
Inventor: QIN JINGUI; WU QI
Prio:
Appl.No: CN201510071737
IPC: C30B 29/22

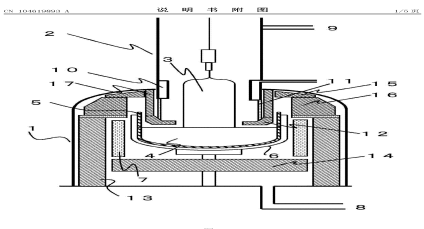


Silicon single crystal growing apparatus and silicon single crystal growing method

Provided is a silicon single crystal growing apparatus in which a graphite crucible is disposed inside a graphite heater and a quartz crucible is disposed inside the graphite crucible and which grows a crystal with the Czochralski method from a raw material molten liquid that fills the quartz crucible. The apparatus comprises, a heater outer insulating member on the outside of the graphite heater, a crucible lower part insulating member on the lower part of the graphite crucible, crucible upper part insulating members on the upper part of the straight body parts of the graphite crucible and the quartz crucible, a crucible outer insulating member positioned on the outside of the straight body part of the graphite crucible, crucible inner insulating members on the inside of the straight body parts of the graphite crucible and the quartz crucible, and a heat shielding member above the liquid surface of the raw material molten liquid. The graphite crucible and the quartz crucible are capable of moving up and down in the space formed inside between the crucible upper part insulating members, crucible outer insulating member and crucible inner insulating members. Accordingly, a silicon single crystal growing apparatus and a silicon single crystal growing method are provided with which heat retaining properties of the liquid surface of the raw material molten liquid can be maintained and dislocation due to solidification, etc. can be suppressed.

Publication: CN 104619893 A 20150513

Applicant: SHINETSU HANDOTAI KK
Inventor: HOSHI RYOJI; SUGAWARA KOSEI
Prio: JP 20121003 2012221472, JP 20130826 2013005009
Appl.No: CN201380047665



IPC: C30B 29/06

Novel environment-friendly and energy-saving growth method of large-sized blocky information storage ferroelectric single crystals

The invention discloses a novel environment-friendly and energy-saving growth method of large-sized blocky information storage ferroelectric single crystals. The method comprises the following steps: heating an information storage ferroelectric single crystal raw material solution to realize the saturation equilibrium; seeding; transforming; carrying out programmed freezing growth; and performing post-treatment and heat crystal transferring. A single crystal mother liquid bottle does not need to be protected by protective gas and internal and external pressure balance can be controlled automatically in a liquid sealing way by using paraffin oil; air circulation between inside and outside is isolated by the paraffin oil and the temperature balance can be maintained precisely. According the method, the large-sized blocky information storage ferroelectric single crystals grow out indirectly; the manufacturing procedure is simple, the raw materials are simple and cheap, waste liquid is recyclable, no pollution or emission of the three wastes is caused; energy is saved since the crystals grow almost at room temperature; environmental friendliness is realized by virtue of growth in an aqueous solution; the manufacturing cost is low.

Publication: CN 104630875 A 20150520

Applicant: UNIV SOUTHEAST
Inventor: FU DAWEI; GE JIAZHEN; XIONG REN GEN; YE HENGYUN; YE QIONG; YOU YUMENG; ZHANG YI
Prio:
Appl.No: CN201510041379
IPC: C30B 7/00

Method for preparing anisotropic photonic crystal

The invention discloses a method for preparing an anisotropic photonic crystal and relates to anisotropic photonic crystals. The method comprises the following steps: (1) adding a hydrophilic monomer, a hydrophobic monomer and a cross-linking agent into a solvent, introducing nitrogen, heating, carrying out a polymerization reaction, adding an initiator solution, further introducing nitrogen for reacting, thereby obtaining monodisperse special-shaped polymeric microspheres; and (2) dispersing the monodisperse special-shaped polymeric microspheres prepared in the step (1) into water, thus obtaining polymeric microsphere emulsion; putting a glass sheet into the polymeric microsphere emulsion, thereby obtaining the anisotropic photonic crystal after the moisture is completely volatilized. According to the addition of the cross-linking agent, cross-linking is performed inside a macromolecular chain, anisotropic microspheres of irregular shapes which are different from the previous microspheres are formed, the operating process is simple and feasible, and the obtained special-shaped microspheres are strictly monodisperse. The polymeric microspheres of special core-shell structures are prepared by polymerizing soap-free emulsion in one step, the operating process is simple and feasible, the produced polymeric microspheres do not contain any impurities such as a surfactant and a buffer agent, the product is pure, and the particle size is controllable.

Publication: CN 104630876 A 20150520

Applicant: UNIV XIAMEN
Inventor: DAI LIZONG; HE KAIBIN; LIU CHAO; LIU XINYU; LIU YONGZHOU; LUO WEIANG; WANG SHUANG; YU SHIRONG; YUAN CONGHUI
Prio:
Appl.No: CN201510078784
IPC: C30B 7/04

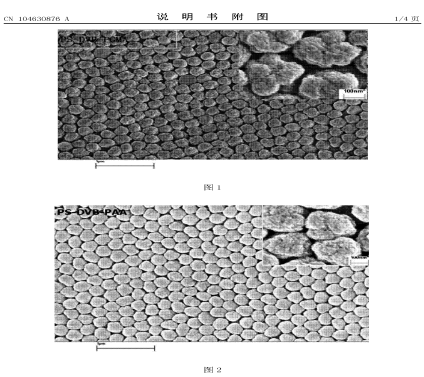


图 1

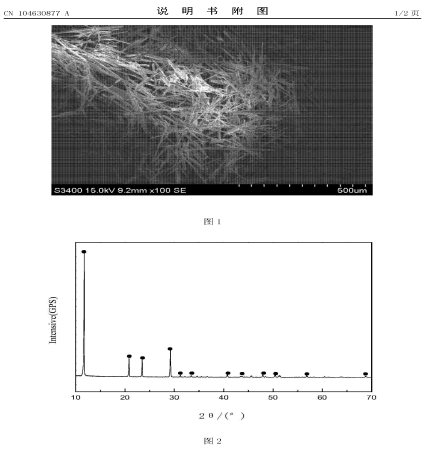
图 2

Method for preparing calcium sulfate dihydrate whisker from tin-smelting waste slag

The invention relates to the technical field of recycling of tin-smelting waste slag and the production of whiskers and particularly relates to a method for preparing a calcium sulfate dihydrate whisker and simultaneously obtaining by-products barium sulfate and silicon oxide from the tin-smelting waste slag. The method comprises the following steps: pre-treating, mixing materials, carrying out acid leaching in hydrochloric acid, removing Ba<2+>, removing impurity, filtering, crystallizing, separating, washing and drying. By the technical scheme disclosed by the invention, the calcium sulfate dihydrate whisker is prepared from the tin-smelting waste slag and has the advantages of high order and complete crystal morphology; the method is high in recovery rate and the by-products are mainly barium sulfate and silicon oxide and high added value is achieved; by the technical scheme, the environmental problem caused by the heaping of the tin-smelting waste slag can be solved, the waste slag can be subjected to resourceful utilization to produce the calcium sulfate dihydrate whisker and the industrial value is created.

Publication: CN 104630877 A 20150520

Applicant: UNIV JIANGSU TECHNOLOGY
Inventor: GE MINGMIN; SUN YANGCHENG; TONG FEI; WANG HUIHUI; YU CONG; ZHOU QUANFA
Prio:
Appl.No: CN201510044703
IPC: C30B 7/14

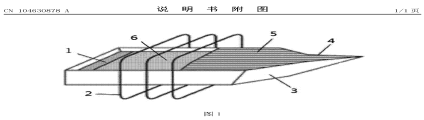


Method for preparing large-sized slablike Ce ion doped rare-earth orthosilicate-series scintillation crystals through horizontal directional solidification

The invention discloses a method for preparing large-sized slablike Ce<3+> ion doped rare-earth orthosilicate-series scintillation crystals through horizontal directional solidification. The method comprises the following steps: forming different temperature areas in a single crystal furnace by heating, wherein the temperature area by which a pre-crystallized material is in a molten state and then forms a melt is a high-temperature area, the temperature area by which a molten raw material is crystallized in a single crystal state is a low-temperature area, and a molten to single-crystal transition area naturally forms a temperature gradient area; then, horizontally moving a crucible filled with the raw material, so that the crucible sequentially passes through the high-temperature area, the transition area and the low-temperature area at a preset speed; and finally, annealing and cooling the obtained product. According to the invention, a horizontal directional solidification method is adopted for preparing Ce<3+>: Re2SiO5 series scintillation crystals, and the scintillation crystals have the outstanding advantages of large size, low defects, high quality, more uniform distribution of Ce<3+> ion concentration, high use ratio, less energy consumption, and the like.

Publication: CN 104630878 A 20150520

Applicant: CN ELECT TECH NO 26 RES INST
Inventor: DING YUCHONG
Prio:
Appl.No: CN201510060384



IPC: C30B 11/00

Method for preparing black phosphorus monocrystal from high-purity red phosphorus under atmospheric pressure

The invention provides a method for preparing black phosphorus monocrystal from high-purity red phosphorus under atmospheric pressure, which comprises the following steps: sufficiently mixing the raw material high-purity red phosphorus with AuSn and SnI4, sealing in a quartz tube, heating in a single-temperature-area furnace, keeping the temperature for some time, cooling to a certain temperature at a certain rate, and quickly cooling to obtain the black phosphorus monocrystal.

Publication: CN 104630879 A 20150520

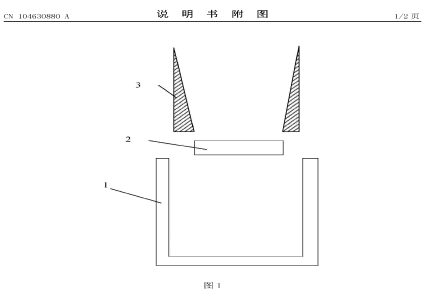
Applicant: ANQING MEIJING NEW MATERIALS CO LTD
Inventor: QIU JUN; ZHANG ZHIMING
Prio:
Appl.No: CN201510090509
IPC: C30B 11/00

Czochralski system for forming single crystal bar and technology method of growing single crystal bar

The invention provides a czochralski system for forming a single crystal bar and a technology method of growing a single crystal bar. The czochralski system comprises a crucible, a thermal insulation ring and a guide cylinder, wherein the thermal insulation ring is arranged above the crucible; the guide cylinder is arranged above the thermal insulation ring. The czochralski system for forming the single crystal bar is provided with the thermal insulation ring, the thermal insulation ring is close to the crucible, namely is close to the growing interface of the single crystal silicon for effectively restraining the heat dissipation on the surface of the crystal bar, reducing the heat dissipation speed difference of the surface and the centre of the crystal bar, further reducing the crystallization rate difference of the surface and the centre of the single crystal bar, and further reducing and changing the convex-concave degree of the growing interface, the difference value of the specific resistance of the surface and the centre of the single crystal bar is less and the uniformity of the radial direction specific resistance of the single crystal bar can be effectively improved.

Publication: CN 104630880 A 20150520

Applicant: BAODING TIANWEI YINGLI NEW ENERGY CO LTD; HEBEI LIUYUN NEW ENERGY TECHNOLOGY CO LTD; YINGLI GROUP LTD; YINGLI SOLAR CHINA CO LTD
Inventor: SI JIAYONG; YIN DONGPO; ZHOU HAO
Prio:
Appl.No: CN201510083137
IPC: C30B 15/00



Method for ultrasonically improving two-dimensional material mono-crystal chemical vapor transportation growth quality

The invention provides a method for ultrasonically improving two-dimensional material mono-crystal chemical vapor transportation growth quality. The method comprises the following steps: sealing the upper end of a quartz tube which is filled with a polycrystalline powder material and a transfer agent material, and then putting into an ultrasonic cleaning machine for cleaning so as to ensure that part of the polycrystalline powder material which is adsorbed at the upper end of the quartz tube can be separated from the tube wall and can be concentrated at the bottom of the quartz tube, and thus the mono-crystal growth quality and efficiency can be effectively improved.

Publication: CN 104630881 A 20150520

Applicant: ANQING MEIJING NEW MATERIALS CO LTD
Inventor: QIU JUN; ZHANG ZHIMING
Prio:
Appl.No: CN201510090428
IPC: C30B 25/00

METHOD FOR MAKING FANCY PALE BLUE OR FANCY PALE BLUE/GREEN SINGLE CRYSTAL CVD DIAMOND AND PRODUCT OBTAINED

A method of making fancy pale blue or fancy pale blue/green CVD diamond material is described. The method comprises irradiating single crystal diamond material that has been grown by a CVD process with electrons to introduce isolated vacancies into the diamond material, the irradiated diamond material having (or after a further post- irradiation treatment having) a total vacancy concentration [VT] and a path length L such that [VT] x L is at least 0.072 ppm cm and at most 0.36 ppm cm, and the diamond material becomes fancy pale blue or fancy pale blue/green in colour. Fancy pale blue diamonds are also described.

Publication: CN 104630882 A 20150520

Applicant: ELEMENT SIX LTD
Inventor: GEOGHEGAN SARAH LOUISE; PERKINS NEIL; TWITCHEN DANIEL JAMES
Prio: GB 20100304 201003613, GB 20100401 201005573, GB 20100510 201007728, GB 20090626 0911075, GB 20091001 0917219
Appl.No: CN201410771629
IPC: C30B 25/02

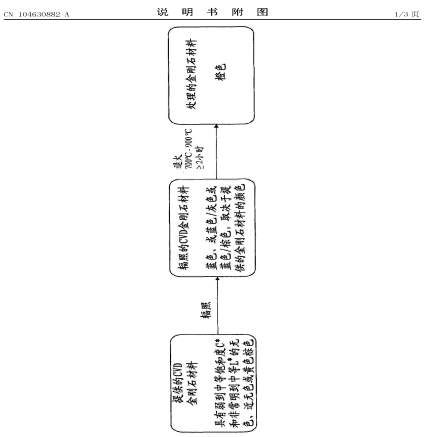


图 1

Multifunctional graphite boat for tellurium-cadmium-mercury vapour-phase epitaxy

The invention discloses a multifunctional graphite boat for tellurium-cadmium-mercury vapour-phase epitaxy. The multifunctional graphite boat comprises four parts, i.e., a graphite base, a graphite cover plate, a graphite masking sheet and a graphite gasket, wherein the graphite masking sheet and the graphite gasket can be respectively placed in the graphite base; the graphite cover plate is arranged at the upper parts of the graphite masking sheet and the graphite gasket to seal the graphite base. The multifunctional graphite boat disclosed by the invention can be used for the tellurium-cadmium-mercury vapour-phase epitaxy growth, and can realize tellurium-cadmium-mercury vapour-phase epitaxy growth of multiple tellurium-cadmium-mercury materials (the size of a substrate can be controlled to be 10mm*10mm-30mm*30mm) with special morphologies (such as rectangular, round, triangular and ring-shaped) and special sizes (various substrates with irregular sizes). The method lays foundation for growth of tellurium-cadmium-mercury selection areas, and can be applied in the field of short-wave, medium-wave and long-wave tellurium-cadmium-mercury vapour-phase epitaxy.

Publication: CN 104630883 A 20150520

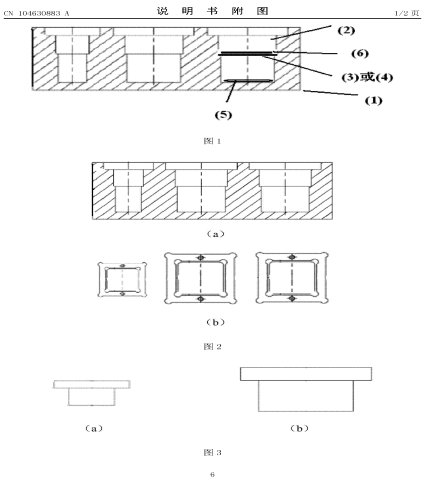
Applicant: SHANGHAI TECH PHYSICS INST

Inventor: DU YUNCHEN; JIAO CUILING; LIN XINGCHAO; LU YE; SHAO XIUHUA; WANG RENG; XU GUOQING; ZHANG KEFENG; ZHANG LIPING

Prio:

Appl.No: CN201410748474

IPC: C30B 25/12



Seed crystal for full-molten efficient polycrystalline silicon ingot, as well as preparation method and application thereof

The invention discloses a seed crystal for a full-molten efficient polycrystalline silicon ingot. The seed crystal is spherical Sic-SiO2 composite particle of which the surface is locally coated with a silicon nitride coating. The invention further discloses a method for preparing the seed crystal for a full-molten efficient polycrystalline silicon ingot and an application of the seed crystal in polycrystalline silicon full-molten efficient ingot. Compared with full-molten seed crystal which is universally used currently, the seed crystal has the advantages that the seed crystal can be directly laid on the silicon nitride coating at the bottom of a crucible rather than being fixed between the bottom of the crucible and the silicon nitride coating, so that the risk of crucible sticking can be radically avoided; the interval of seeding points of the seed crystal does not need to be controlled, so that a better seeding effect can be realized, and the dislocation proportion in silicon ingots can be reduced; and since SiC and SiO2 composite material is used as the seed crystal, the content of interstitial oxygen at the middle lower part of silicon ingots can be remarkably reduced in comparison of quartz granular seed crystal.

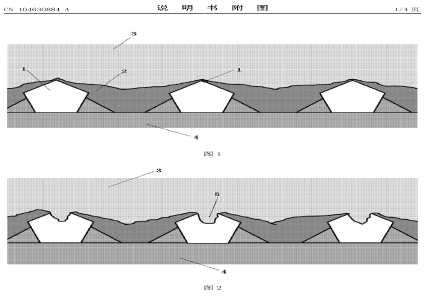
Publication: CN 104630884 A 20150520

Applicant: DONGHAI JA SOLAR TECHNOLOGY CO LTD

Inventor: DONG HUI; HUANG XINMING; WANG ZIXU; YIN CHANGHAO; ZHONG GENXIANG

Prio:

Appl.No: CN201510037057



IPC: C30B 28/06

Method for producing polysilicon ingots

The invention provides a method for producing polysilicon ingots. The method comprises the following steps: (a) mixing nanoscale silicon powder and absolute ethyl alcohol, and coating the bottom surface inside a crucible with the mixture; and (b) adding silicon into the crucible, and performing ingot casting production, thereby obtaining the polysilicon ingots. Compared with the prior art, the method for producing the polysilicon ingots provided by the invention has the advantages that the nanoscale silicon powder serves as a nucleating agent; and because the body surface area of the nanoscale silicon powder is large, more nucleating points are uniformly induced, and macroscopic crystal defects such as crystal boundary and dislocation due to spontaneous disordered growth of the crystal are reduced, so that the number of sub-load centers in the crystal is further reduced, and the photoelectric conversion efficiency of the polysilicon is greatly improved.

Publication: CN 104630885 A 20150520

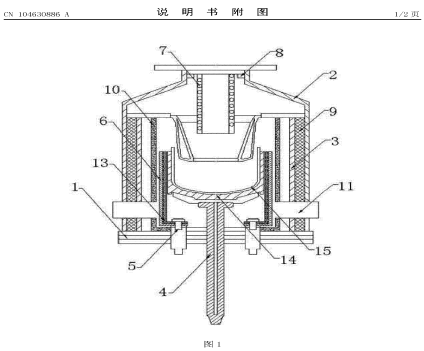
Applicant: DAQO NEW ENERGY CO LTD
Inventor: ZENG XIANGHUI; ZHANG SHIHUA
Prio:
Appl.No: CN201510117058
IPC: C30B 28/06

Crystalline silicon growth device

The invention discloses a crystalline silicon growth device. The crystalline silicon growth device comprises a fixed base, an outer insulation barrel, an inner insulation barrel, a centre shaft supporting rod, a heating electrode, a heater and a water cooling device, wherein a snap ring is arranged on an inner side of an upper end opening on the outer insulation barrel; the water cooling device is snapped on the snap ring; the inner insulation barrel is arranged inside the outer insulation barrel; a graphite felt layer is filled between the inner insulation barrel and the outer insulation barrel; an insulation layer is arranged inside the inner insulation barrel; a certain interval is reserved between the insulation layer and the inner insulation barrel; the heater is arranged inside the insulation layer; two fixed lugs are bilaterally and symmetrically arranged at the lowest edge positions on an inner side of the heater in such a way that a center line of the heater is taken as a baseline; electrode fixing holes are arranged on the fixed lugs; a heat conducting layer is arranged on the inner side of the heater; the heating electrodes are fixed on the electrode fixing holes which are arranged on the fixed lugs; the centre shaft supporting rod is arranged at a center position of the fixed base; a crucible holder is arranged at an upper end of the centre supporting rod and a crucible is arranged on the crucible holder. The crystalline silicon growth device has the advantages of simple structure, stable heat distribution and uniform heat flow.

Publication: CN 104630886 A 20150520

Applicant: LUOYANG GIANT NEW ENERGY TECHNOLOGY CO LTD
Inventor: CHEN KUNZHU; LI SHENGQI; LIN YANTING; ZHANG LIFENG
Prio:
Appl.No: CN201510065833
IPC: C30B 29/06

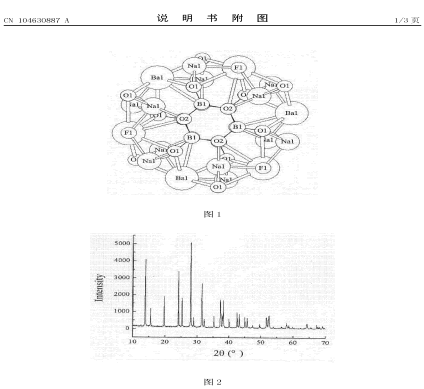


Barium sodium fluoborate birefringent crystal, preparation method and applications thereof

The invention relates to a barium sodium fluoborate birefringent crystal, a preparation method and applications thereof. The chemical formula of the crystal is Na3Ba2(B3O6)2F, the molecular weight is 459.37, the crystal belongs to the hexagonal crystal system, the space group is P6(3)/m, and the cell parameters are as follows: a=7.3490(6)[angstrom], c=12.6340(2)[angstrom], V=590.93(12) [angstrom]<3>, and Z=2. The crystal is used in a wavelength range from infrared to deep purple, and is a negative uniaxial crystal, n<e> < n<o>. The transmission range is 180 to 3300 nm, and the birefringence is in a range of 0.090(3300 nm) to 0.240(180 nm). The crystal can be grown by a high-temperature melt method (self-melt spontaneous crystallization method, melt Czochralski method, and melt top-seeding method) or a flux growth method. The crystal obtained by the provided method has the advantages of easiness for growth, cutting, grinding, polishing, and storage, stability in air, difficulty in degradation caused by dampness, and water insolubility. The crystal can be used to produce polarization beam splitter prisms such as Glan prism, Wollaston prism, Rochon prism, beam separating polarizer, and the like, and is widely used in the fields of optics and communication.

Publication: CN 104630887 A 20150520

Applicant: XINJIANG TECH INST PHYSICS CAS
Inventor: PAN SHILIE; ZHANG HUI; ZHANG MIN
Prio:
Appl.No: CN201310549626
IPC: C30B 29/12



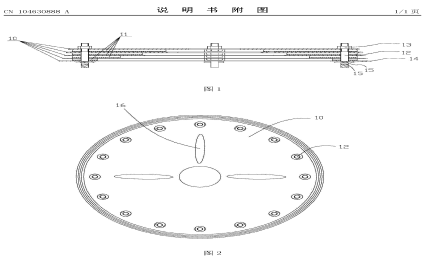
11

Visual crucible cover for sapphire growth furnace

The invention relates to a visual crucible cover for a sapphire growth furnace. The visual crucible cover comprises multiple layers of ring plates, wherein the ring plates are penetrated and fixed into a whole by virtue of a tungsten screw unit; U-shaped isolation pads are arranged between the ring plates; the ring plates are arranged from top to bottom, the inner diameters of the ring plates are gradually increased, and the outer diameters of the ring plates are gradually increased; observation holes are formed in the ring plates; and all the ring plates penetrate through the observation holes. According to the crucible cover disclosed by the invention, a mode of combining the tungsten ring plates on the lower layer and the molybdenum ring plates on the upper layer is adopted, and the U-shaped isolation pads are arranged between the ring plates, so that the cost is saved, a certain structural strength of the whole crucible cover can be guaranteed, the service life of the whole crucible cover is prolonged, and the phenomena that the temperature gradient at the upper end of the crucible opening changes due to severe deformation and the purity of the raw materials is influenced due to drop of volatile matters and impurities are effectively avoided.

Publication: CN 104630888 A 20150520

Applicant: FUJIAN XINJING SAPPHIRE TECHNOLOGY CO LTD
Inventor: HUANG XIAOWEI; LI TAO; LIU ZHUPING; PEI GUANGQING
Prio:
Appl.No: CN201410794516



6

IPC: C30B 29/20

Sapphire single growth furnace heat preservation device capable of conveniently regulating temperature gradient

The invention relates to a sapphire single growth furnace heat preservation device capable of conveniently regulating temperature gradient. The device comprises an upper heat screen, a lateral temperature control system and a lower heat preservation system, wherein the side walls of the lateral temperature control system have different thicknesses in the height direction; and the lateral temperature control system is used for adjusting the temperature gradient in the sapphire single growth furnace. According to the device disclosed by the invention, the heat preservation system can be easily and moderately adjusted by virtue of the quality of crystals produced by each furnace turn, so that the temperature gradient suitable for large-size high-quality sapphire single crystal growth is formed, and the quality of the large-size crystals is improved; the heat preservation structure is diversified in functions, high in flexibility and adjustable, and the energy consumption can be greatly reduced; and meanwhile, the problems that the traditional tungsten-molybdenum heat preservation structure deforms in a high-temperature environment and is short in service life and high in cost and the like can be solved.

Publication: CN 104630889 A 20150520

Applicant: FUJIAN XINJING SAPPHIRE TECHNOLOGY CO LTD

Inventor: HUANG XIAOWEI; LI TAO; LIU ZHUPING; PEI GUANGQING

Prio:

Appl.No: CN201410794530

IPC: C30B 29/20

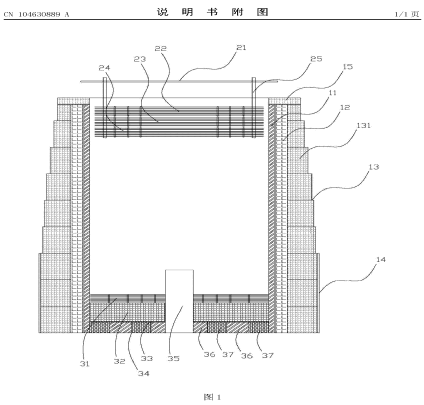


图 1

8

Self-frequency multiplication laser crystal neodymium-doped calcium pyroniobate

The invention provides self-frequency multiplication laser crystal neodymium-doped calcium pyroniobate. A pulling method is adopted, the growth parameters are as follows: the growth temperature is 1470-1500 DEG C, the pulling velocity is 0.4-3mm/hour, the rotation speed is 5-20rpm, the annealing speed is 15-50 DEG C/hour, and Nd<3+>:SrCaNb2O7 crystal with large size and excellent quality can be grown. The crystal belongs to an orthorhombic system and a Cmc21 space group, and the crystal cell parameter is as shown in the specification. The crystal has the characteristics of moderate mechanical property and thermal energy, good spectral property, large effective non-linear coefficient and the like, and is a relatively good self-frequency multiplication laser crystal material.

Publication: CN 104630890 A 20150520

Applicant: FUJIAN MATTER STRUCTURE

Inventor: HUANG YISHENG; LIN ZHOUBIN; SUN SHIJIA; WU HUI; YUAN FEIFEI; ZHANG LIZHEN

Prio:

Appl.No: CN201510074175

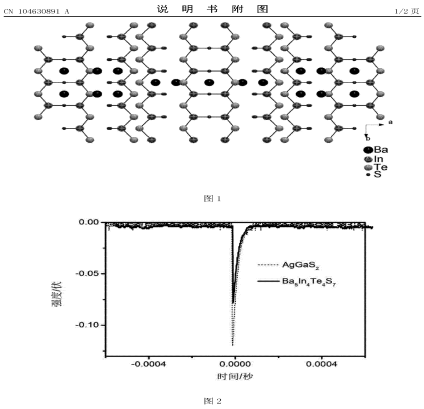
IPC: C30B 29/30

Infrared nonlinear optical single crystal sulfur tellurium indium barium

The invention relates to an infrared nonlinear optical single crystal sulfur tellurium indium barium as well as preparation and an application thereof. The sulfur tellurium indium barium has the molecular formula of Ba5In4Te4S7, has the molecular weight of 1880.75, belongs to the orthorhombic crystal system, has space group of Imm2 and has the single cell parameter, the formula is as shown in specification. The sealed vacuum quartz tube and the graphite crucible are adopted and the high temperature reaction method is used. The SHG strength of the power with granularity of 74-106mu m is lower than the corresponding granularity of AgGaS2 tested by the experiment, the sulfur tellurium indium barium crystal has obvious advantage on the infrared band transmission side and has the broadband transmission range of 0.57-25 microns, and the sulfur tellurium indium barium crystal has excellent infrared nonlinear optical property.

Publication: CN 104630891 A 20150520

Applicant: FUJIAN MATTER STRUCTURE
Inventor: CHENG WENDAN; LIN CHENSHENG; LUO ZHONGZHEN; TAN DEMING; ZHANG HAO; ZHANG WEILONG
Prio:
Appl.No: CN201510074995
IPC: C30B 29/46



Method for growing molybdenum disulfide single crystal by vapor phase transportation method

The invention provides a method for growing molybdenum disulfide single crystal by a vapor phase transportation method. The method comprises the following steps: by taking pure molybdenum powder and pure sulfur powder as raw materials, performing chemical reaction at a high temperature to obtain a polycrystal molybdenum disulfide material; putting molybdenum disulfide polycrystal and tantalum pentachloride into a furnace with three temperature regions to perform vapor phase transportation reaction, thereby obtaining high-purity molybdenum disulfide single crystal.

Publication: CN 104630892 A 20150520

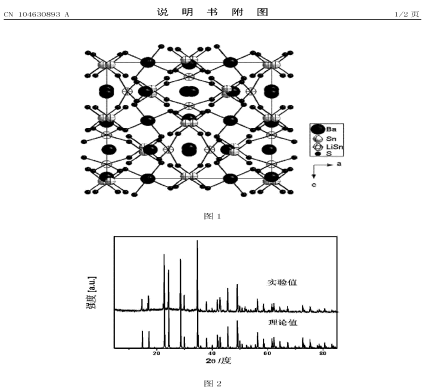
Applicant: ANQING MEIJING NEW MATERIALS CO LTD
Inventor: QIU JUN; ZHANG ZHIMING
Prio:
Appl.No: CN201510090506
IPC: C30B 29/46

Infrared nonlinear optical sulfur, stannum, lithium and barium crystal

The invention relates to an infrared nonlinear optical sulfur, stannum, lithium and barium crystal and a preparation method and application thereof. The molecular weight of the sulfur, stannum, lithium and barium crystal (with the molecular formula of Ba24Li10.68Sn17.32S64) is 7478.58, the sulfur, stannum, lithium and barium crystal belongs to a cubic system, the space group is I-43d, and the unit cell parameter is expressed in a formula which is shown in the description. The infrared nonlinear optical sulfur, stannum, lithium and barium crystal is prepared by virtue of high-temperature solid-phase reaction by adopting a graphite crucible and a vacuum sealed quartz tube. The sulfur, stannum, lithium and barium crystal has relatively good infrared non-linear optical performance. Through experimental determination, the SHG strength of the powder (with the grain size of 25-45 microns) is about 1.4 times the corresponding grain size of AgGaS2.

Publication: CN 104630893 A 20150520

Applicant: FUJIAN MATTER STRUCTURE
Inventor: CHENG WENDAN; LIN CHENSHENG; LUO ZHONGZHEN; TAN DEMING; ZHANG HAO; ZHANG WEILONG
Prio: CN 20150212 201510074695
Appl.No: CN201510098648
IPC: C30B 29/46



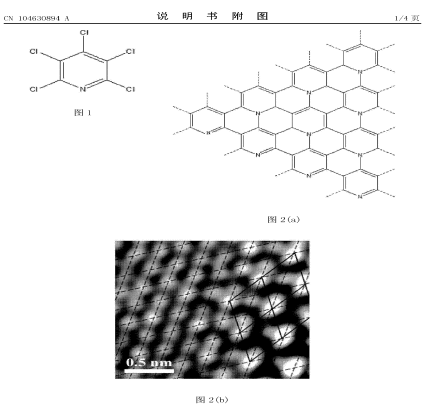
6

Two-dimensional carbon nitrogen single crystal alloy and preparation method thereof

The invention provides a two-dimensional carbon nitrogen single crystal alloy, which contains a carbon skeleton of graphene and doping nitrogen atoms. Specifically, the doping nitrogen atoms replace part of carbon atoms in the carbon skeleton of graphene to form a two-dimensional superlattice structure of nitrogen, and the lattice size of the superlattice is 0.4nanometer-0.5nanometer. The invention also provides a preparation method for the two-dimensional carbon nitrogen single crystal alloy. The method includes the steps of: a) treating the surface of a metal substrate to obtain a flat and clean surface; b) heating the flat and clean surface; c) depositing a layer of precursor molecules on the heated surface; and d) further performing heating and maintaining the temperature to form the two-dimensional carbon nitrogen single crystal alloy. Specifically, the precursor molecule is a perhalogenated pyridine molecule.

Publication: CN 104630894 A 20150520

Applicant: USTC UNIV SCIENCE TECH CN
Inventor: CUI PING; ZENG CHANGGAN; ZHANG HUI; ZHANG ZHENYU
Prio: CN 20131107 201310552915
Appl.No: CN201310557207
IPC: C30B 29/52



12

Single-crystal magnesium alloy biodegradable material and preparation method thereof

The invention relates to a single-crystal magnesium alloy biodegradable material which is characterized in that the single-crystal magnesium alloy biodegradable material is an Mg-X single-crystal biological implant material, wherein X refers to one of Zn, Ca, Gd, Dy, Y and Sm; the content of X is 0.05-25.3 percent; the rest is Mg; the total amount of impurity elements in magnesium alloy single crystal is less than or equal to 0.005 percent, and in the impurity elements, the content of Fe is less than or equal to 0.0005 percent, the content of Ni is less than or equal to 0.0005 percent, and the content of Cu is less than or equal to 0.001 percent. The invention also relates to a method for preparing the single-crystal magnesium alloy biodegradable material. According to the single-crystal magnesium alloy biodegradable material disclosed by the invention, the influence of the alloy grain boundary and precipitated phase on the corrosion resistance of the alloy can be eliminated, the mechanical property of the magnesium alloy biodegradable material at the treatment stage can be maintained, the metal ions can be completely formed in the degradation process to be absorbed by the human body or discharged out of the body, the degradation difficulty of metal compounds is avoided, and design diversity is provided for biological devices suitable for different patients and different parts.

Publication: CN 104630895 A 20150520

Applicant: CHINA WEAPON SCIENCE ACADEMY NINGBO BRANCH

Inventor: HUANG YUANDING; LIAN FUKUI; REN ZHENG; TAN SUOKUI; ZHANG XIAO; ZHU XIURONG

Prio:

Appl.No: CN201410841415

IPC: C30B 29/52

Non-linear optical device with C18H16N2O2 single crystal and preparation method of non-linear optical device

The invention relates to a C18H16N2O2 non-linear optical device and a preparation method thereof. The C18H16N2O2 crystal can be prepared by using a spontaneous crystallization cooling method and a seed crystal method, and the growing method of the C18H16N2O2 crystal is simple, easy to operate and low in cost; the prepared C18H16N2O2 non-linear optical crystal has a relatively wide penetration wave section of 0.55-2.2mu m, the powder frequency-doubled effect intensity of the C18H16N2O2 non-linear optical crystal is of 2-3 times of OH1, and the C18H16N2O2 non-linear optical crystal is stable in physical and chemical property and free from deliquescence; the C18H16N2O2 non-linear optical crystal can be used for preparing a non-linear optical device, and at the room temperature, an Ho:Tm:Cr:YAG Q-adjusting laser is used as a light source for inputting infrared light of which the wavelength is 2090nm and outputting infrared laser of which the wavelength is 1045nm; the C18H16N2O2 non-linear optical device comprises a device in which at least one beam of incident electromagnetic radiation passes through at least one piece of the C18H16N2O2 single crystal so as to generate at least one beam of output radiation of which the frequency is different from that of the incident electromagnetic radiation; the device can be a terahertz wave generator, a secondary harmonic generator, an upper frequency converter, a lower frequency converter or an optical parametric oscillator.

Publication: CN 104630896 A 20150520

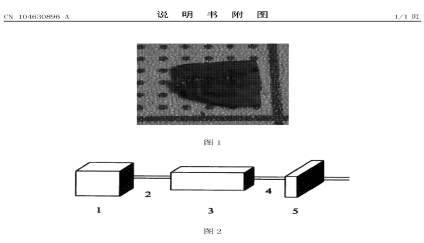
Applicant: CHINESE ACAD TECH INST PHYSICS

Inventor: LI YIN; WU YICHENG; YAO JIYONG; ZHANG GUOCHUN; ZHANG XINYUAN

Prio:

Appl.No: CN201510030653

IPC: C30B 29/54



Preparation method of 8-hydroxyquinoline metal complex crystal micron/nano rod

The invention relates to a preparation method of an 8-hydroxyquinoline metal complex crystal micron/nano rod. The preparation method comprises the following steps: dissolving an 8-hydroxyquinoline metal complex into an organic solvent to obtain an 8-hydroxyquinoline metal complex solution with concentration of 28-50mg/ml; dropwise adding the 8-hydroxyquinoline metal complex solution onto a substrate; and controlling the volatilization speed of the organic solvent through the hole number so that the organic solvent is completely volatized in 5-50h, wherein after the organic solvent is completely volatized and removed, a micron/nano rod of 8-hydroxyquinoline metal complex crystal grows on the substrate. The preparation method provided by the invention is simple to operate and does not need a surfactant, water and other raw materials, thereby greatly reducing the preparation cost and shortening the technological process; and the prepared micron/nano rod of 8-hydroxyquinoline metal complex crystal is uniform and dense.

Publication: CN 104630897 A 20150520

Applicant: UNIV SHANDONG
Inventor: FAN JIHUI; HAN SHENGHAO; PANG ZHIYONG; SONG HUI; XIE WANFENG; YUAN HUIMIN
Prio:
Appl.No: CN201510044697
IPC: C30B 29/54

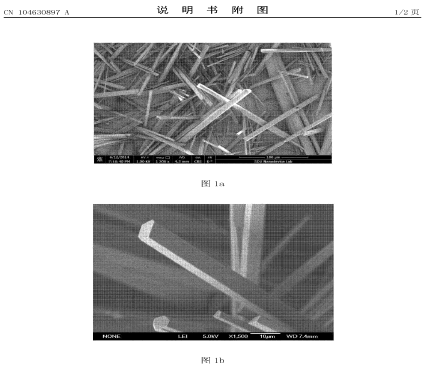


图 1a

图 1b

7

Method for preparing conductive titanium dioxide whiskers

The invention discloses a method for preparing conductive titanium dioxide whiskers. The method comprises the following steps: mixing a potassium salt and titanium dioxide, calcining, boiling for 1-24 hours with water and drying, thereby obtaining a solid A; pickling the solid A in a hydrochloric acid solution for 1-12 hours, filtering, washing, drying and calcining the solid, thus forming the titanium dioxide whiskers; dissolving a tin salt and an antimonic salt in water, thereby obtaining a mixed solution B; pulping the titanium dioxide whiskers in water, performing ultrasonic treatment for fully dispersing, thereby obtaining titanium dioxide suspension; dropwise adding the mixed solution B into the titanium dioxide suspension, regulating the pH value to 1-4 by using 0.01-10mol/L alkali liquor, thereby obtaining milk white turbid liquid; filtering, washing and drying the turbid liquid, and grinding into particles; and performing high-temperature treatment at the temperature of 400-800 DEG C for 1-5 hours, thereby obtaining the conductive titanium dioxide whiskers. The conductive titanium dioxide whiskers obtained by the invention have the diameter of 0.1-0.3 micron and the length of 0.4-5 microns and are excellent in conductivity and uniform in morphology.

Publication: CN 104630898 A 20150520

Applicant: UNIV JIANGNAN
Inventor: GAO CHUNXIA; GAO QIANG; GE MINGQIAO; MA HUI
Prio:
Appl.No: CN201510081677
IPC: C30B 29/62

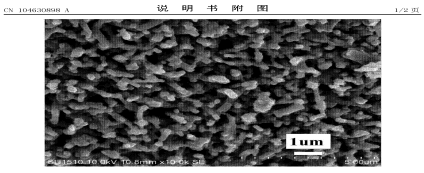


图 1

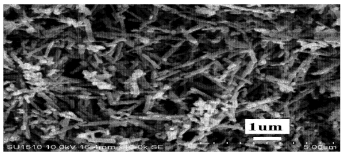


图 2

7

Separation method of diamond layer

The invention discloses a separation method of a diamond layer, which comprises the following steps: carrying out two-dimensional scanning on the diamond inside to be treated by a laser, and forming a non-diamond layer a certain depth below the surface of the diamond to be treated; and removing the non-diamond layer to implement the up-down separation of the diamond layer. The method can not destroy the diamond substrate surface. Compared with the laser cutting technique, the method lowers the loss in diamond cutting. Compared with the ion implantation separation technique, the method saves the cost and shortens the processing time.

Publication: CN 104630899 A 20150520

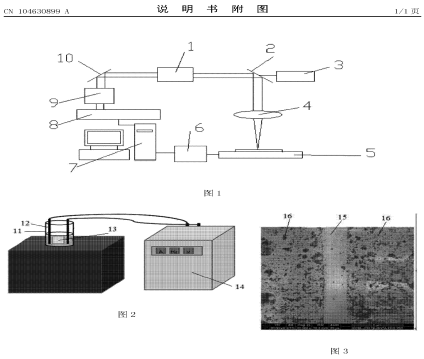
Applicant: WANG HONGXING

Inventor: BU REN AN; CHEN FENG; FU JIAO; HOU XUN; WANG FEI; WANG HONGXING; YAN JIANPING; ZHANG JINGWEN

Prio:

Appl.No: CN201510023495

IPC: C30B 33/04



8

Surface texturing processing method of monocrystalline silicon solar cell

The invention discloses a surface texturing processing method of a monocrystalline silicon solar cell. The processing method comprises the following steps: cleaning oil stains and finger prints on a surface of a monocrystalline silicon wafer by ultrasonic; surface texturing, which comprises putting the ultrasonic cleaned monocrystalline silicon wafer into a texturing tank which contains a sodium hydroxide solution having a mass volume percentage of 2%, performing surface corrosion texturing processing; and adding TS4 as a texturing catalyst into the sodium hydroxide solution to increase a silicon surface corrosion speed and uniformity of surface corrosion; removing an oxide from the surface of the monocrystalline silicon wafer, and cleaning the monocrystalline silicon wafer by using a hydrofluoric acid solution (a concentration of 49%) with a volume percentage of 16%; removing metal ions, and cleaning the monocrystalline silicon wafer by using a hydrochloric acid solution (a concentration of 37%) with a volume percentage of 28%; and drying the final monocrystalline silicon wafer with a pyramid-shaped surface. According to the invention, a surface texturing speed of the monocrystalline silicon wafer is increased; uniformity of surface texturing of the monocrystalline silicon wafer is improved; and then monocrystalline silicon solar cell prepared by the method is higher in photoelectric conversion efficiency of the solar cell and good in stability. The surface texturing processing method is a better choice for application of photovoltaic power generation.

Publication: CN 104630900 A 20150520

Applicant: JIANGSU TIANYU PHOTOVOLTAIC SCIENCE & TECHNOLOGY CO LTD

Inventor: DAI WANGSHUAI; GU DONGSHENG; LIANG JIAN; WANG HAOBING; XU GUOQI

Prio:

Appl.No: CN201310562781

IPC: C30B 33/10

Raw material filling method, method for manufacturing single crystal, and device for manufacturing single crystal

The present invention is a raw material filling method wherein raw material is accommodated in a recharging tube that has a cylindrical member that is made of quartz and accommodates the raw material and a circular cone valve for opening and closing an opening part in the lower end of the cylindrical member; the recharging tube that accommodates the raw material is set inside a chamber, and the raw material accommodated in the recharging tube is introduced into a quartz crucible by lowering the circular cone valve and opening the opening part in the lower end of the cylindrical member. The raw material filling method is characterized by arranging the recharging tube and the quartz crucible such that the distance between the lower end of the recharging tube and raw material or a melt in the quartz crucible at the beginning of the introduction of the raw material is 200 - 250 mm, and, thereafter, introducing the raw material while simultaneously lowering the quartz crucible and the circular cone valve of the recharging tube such that the ratio (CL/SL) of the lowering rate (CL) of the quartz crucible and the lowering rate (SL) of the circular cone valve of the recharging tube is 1.3 - 1.45. Thus, damage to the quartz crucible and recharging tube can be suppressed.

Publication: CN 104641024 A 20150520

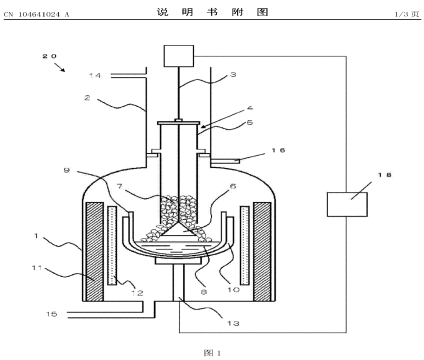
Applicant: SHINETSU HANDOTAI KK

Inventor: KITAGAWA KATSUYUKI; URANO MASAHIKO; YOSHIDA KATSUHIRO

Prio: JP 20121120 2012254568, JP 20131028 2013006344

Appl.No: CN201380048354

IPC: C30B 15/02



11

Tubular growth furnace

The invention discloses a tubular growth furnace. Through a scheme of manufacturing a relatively large temperature gradient by combination of simple tubular furnace bodies, the tubular growth furnace comprises a heating furnace ring (an upper furnace) with a relatively small ring diameter, a heating furnace ring (a lower furnace) with a relatively large ring diameter, a gradient zone, and a corresponding thermal insulation material. The problems that a few of crystals are overlarge in supercooling degree and single crystal needs a large temperature gradient to grow are solved; the adjustable range of the temperature gradient of the furnace body is greatly improved; and a novel solving scheme is provided for growth of a few of high-quality crystals.

Publication: CN 104651924 A 20150527

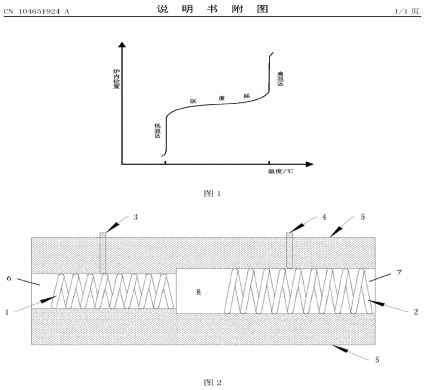
Applicant: INST CHEMICAL MATERIAL CHINA ACADEMY ENGINEERING PHYSICS; SICHUAN RES CT OF NEW MATERIALS

Inventor: CHEN YING; DOU YUNWEI; FANG PAN; KANG BIN; TANG MINGJING; YIN WENLONG; YUAN ZERUI; ZHANG YU

Prio:

Appl.No: CN201510101607

IPC: C30B 11/00



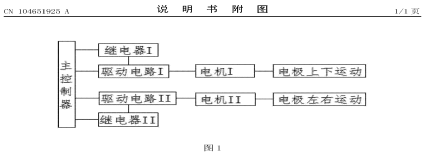
7

Melting control system for quartz crucible melting machine

The invention relates to a melting control system for a quartz crucible melting machine. The melting control system comprises a main controller, a relay I, a drive circuit I, a drive circuit II and a relay II, wherein the relay I, the drive circuit I, the drive circuit II and the relay II are connected with the main controller; the relay I is connected with the drive circuit I, the drive circuit I is connected with a motor I, and the motor I drives an electrode to move upwards and downwards; and the relay II is connected with the drive circuit II, the drive circuit II is connected with a motor II, and the motor II drives the electrode to move left and right. According to the utility model, two sets of motors are adopted for respectively driving the electrode to move up, down, left and right, and a PLC programmable logic controller is adopted and can accurately control the movement of the motors so as to realize the precise movement of the electrode.

Publication: CN 104651925 A 20150527

Applicant: XI AN ELITE ELECTRONIC IND CO
Inventor: GAO XIMEI; ZHANG XINLI; ZHU JUNWU
Prio:
Appl.No: CN201310579586
IPC: C30B 15/20



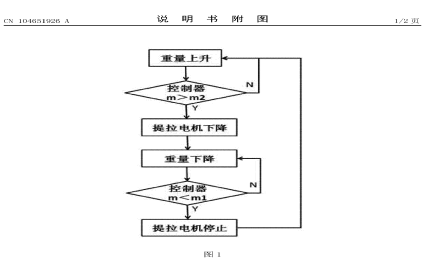
5

Control method for protecting clamping device in case of sticking during sapphire growth

The invention relates to a control method for a clamping device, and in particular relates to a control method for protecting a clamping device when sapphire growth is sticky. According to the invention, the upper limit value of the weighing amount is set to be m2; the lower limit value of the weighing amount is set to be m1; the charging amount is set to m0; namely, m0<m1<m2; in the growing process, a weighing device transmits the instantaneous weight of crystals to a controller; when the measured weight of the crystals is m<m2, the controller controls a lift motor to descend with the speed of v; therefore, irreversible damage to the clamping device due to excessive weight is prevented; the service life of the clamping device is prolonged; simultaneously, generation of the crystal cracking phenomenon is reduced; the measured weight of the crystals is also reduced along with descending of the lift motor; when m<m1, the lift motor stops descending; cracking of the crystals due to the fact that the weight of the crystals is applied to an adhesive surface is avoided; after the lift motor stops descending, the weight m of the crystals is increased again due to sticky contraction; when m> m2, the lift motor descends again with the speed of v; and the cycle repeats.

Publication: CN 104651926 A 20150527

Applicant: INNER MONGOLIA J CRYSTAL PHOTOELECTRIC TECHNOLOGY CO LTD
Inventor: LUO RENHUI; MA ZHONGQI; QIN YINGSU; YANG MINGCHAO
Prio:
Appl.No: CN201510113613
IPC: C30B 15/20



5

Zinc selenide crystal

The invention discloses a zinc selenide crystal. The zinc selenide crystal is prepared by the following process: (1), screening and removing impurity from zinc selenide powder; (2), putting the treated zinc selenide powder into a physical vapor deposition furnace, and heating under a vacuum condition, so that zinc selenide vapor is solidified and deposited at the cold end from the hot end to obtain crystals; (3), checking the obtained zinc selenide crystals: cutting the zinc selenide crystals with the preset indexes of a qualified product; (4), putting the unqualified zinc selenide crystals and scraps from the cutting procedure in the step (3) into a sealed container, breaking and recycling; and (5), packaging the qualified crystals by vacuum aluminum plastic paper, and sealing the opening by utilizing a vacuum sealing machine. In the whole preparation procedure, no auxiliary materials or solvents are used, and the whole procedure is performed in a clean room; a physical vapor deposition temperature rising control operation is safe and reliable, and the internal air and the external air of the clean room are highly effectively filtered and isolated, therefore, on the one hand, the quality of products is ensured; and on the other hand, the production personnel and the external environment are protected.

Publication: CN 104651927 A 20150527

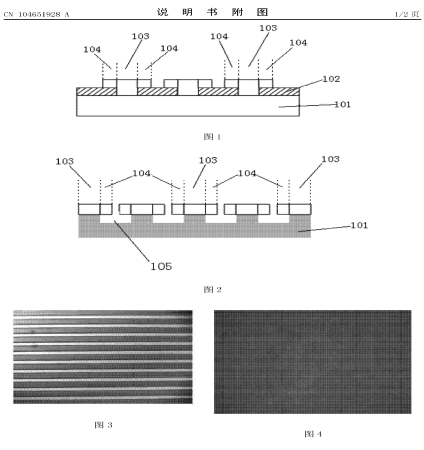
Applicant: XUYI XINYUAN OPTICAL SCIENCE TECHNOLOGY CO LTD
Inventor: CHEN DAOLI
Prio:
Appl.No: CN201410856434
IPC: C30B 23/00

Homogeneous epitaxial lateral growth method for diamond

The invention discloses a homogeneous epitaxial lateral growth method for diamond. The method comprises the following steps: 1, depositing a mask layer on the bottom surface of a monocrystal diamond substrate; 2, patterning the surface, deposited with the mask layer, of the substrate, thus forming the substrate with a patterned surface, wherein the patterned surface of the substrate is divided into a homogeneous epitaxial growth area and a lateral growth area; and 3, carrying out homogeneous epitaxial diamond growth in the homogeneous epitaxial growth area, and carrying out lateral diamond growth in the lateral growth area. By combining with the lateral growth method, an existing homogeneous epitaxial growth technique of monocrystal diamond is improved; a monocrystal diamond film which is low in dislocation density, high in quality and smooth in surface can effectively grow; the difficulty in epitaxial growth of the monocrystal diamond film for an electronic device is reduced; the film quality is improved; and meanwhile, the technique can be applied to control over the growth structure of the monocrystal diamond film, so as to obtain a monocrystal diamond micro-structure required by MEMS and the like.

Publication: CN 104651928 A 20150527

Applicant: WANG HONGXING
Inventor: BU REN AN; HOU XUN; LI SHUOYE; WANG HONGXING; WANG WEI; ZHANG JINGWEN
Prio:
Appl.No: CN201510023907
IPC: C30B 25/20



Electron beam melting polysilicon deoxygenation and ingot casting coupling method and apparatus thereof

The invention belongs to the field of metallurgic melting, and especially relates to an electron beam melting polysilicon deoxygenation and ingot casting coupling method and an apparatus thereof. The method comprises the following steps: carrying out vacuum pumping on a furnace body and electron guns, starting a melting electron gun to carry out electron beam melting on a polysilicon material, and melting to preliminarily remove impurity oxygen; maintaining a liquid state under the action of a radiation electron gun to further remove oxygen, guiding the obtained material to enter an ingot casting device through a water cooled conveyor belt, and carrying out oriented crystal growth to obtain polysilicon cast ingots. The apparatus comprises an electron beam melting assembly and an ingot casting coupling assemble, the ingot casting coupling assembly comprises the ingot casting device, the ingot casting device is positioned under the water cooled conveyor belt, and the flow guiding opening of the water cooled conveyor belt is positioned over the center of the quartz crucible of the ingot casting device. The electron beam melting deoxygenation method and a use thereof are provided for the first time, electron beam deoxygenation is realized, and ingot casting coupling is combined, so energy required by ingot casting heating of the raw material is reduced, and the production efficiency is greatly improved.

Publication: CN 104651929 A 20150527

Applicant: QINGDAO LONGSHENG CRYSTALLINE SILICON TECHNOLOGY C

Inventor: AN GUANGYE; GUO XIAOLIANG; JIANG DACHUAN; TAN YI; WANG DENGKE

Prio:

Appl.No: CN201310596052

IPC: C30B 28/06

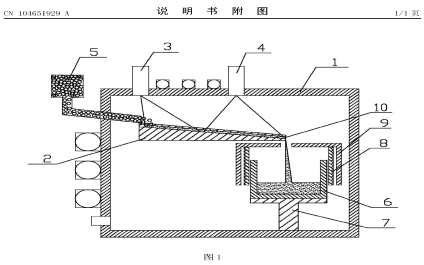


图 1

10

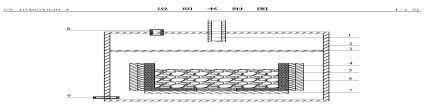
Apparatus for preparing polysilicon through electron beam deoxygenation and preliminary ingot casting coupling, and method thereof

The invention belongs to the field of polysilicon ingot casting, and especially relates to an apparatus for preparing polysilicon through electron beam melting deoxygenation and crystal growing technology coupling, and a method thereof. The apparatus is characterized in that the top of a furnace body is connected and provided with an electron gun, the upper end of the side portion of the furnace body is provided with a gas charging valve, the lower end of the furnace body is provided with a gas discharging valve, a quartz crucible is arranged in the furnace body, the outer wall of the quartz crucible is sequentially encircled with a graphite hater and a graphite carbon felt from inside to outside, the top of the graphite carbon felt is provided with a heat insulation cover, the central position of the bottom of the quartz crucible is provided with a hole, and the bottom of the quartz crucible is provided with a water cooled copper pedestal. The method comprises the following steps: charging, and carrying out vacuum pumping; heating to completely fuse a silicon material; carrying out high pressure and beam preheating, and stopping high pressure and beam; maintaining the silicon material in a liquid state; carrying out electron beam melting deoxygenation; carrying out preliminary ingot casting crystal growth; adjusting a graphite heater to make the growth speed of silicon crystals to 1.2-1.3cm/h; and cooling, and taking the obtained polysilicon. The method realizes two technologies on the same apparatus, electron beam melting is used to remove oxygen impurities in silicon, the total energy consumption reduces by 30%, and the production efficiency increases by 40%.

Publication: CN 104651930 A 20150527

Applicant: QINGDAO LONGSHENG CRYSTALLINE SILICON TECHNOLOGY C

Inventor: AN GUANGYE; GUO XIAOLIANG; JIANG DACHUAN; TAN YI; WANG DENGKE



Prio:
Appl.No: CN201310596367
IPC: C30B 28/06

Quartz crucible capable of controlling nucleation and impurity diffusion and used for polycrystal cast ingot and preparation method of quartz crucible

The invention discloses a quartz crucible capable of controlling a nucleation and impurity diffusion and used for a polycrystal cast ingot. A preparation method of the quartz crucible comprises the following steps: firstly, painting a high-purity coating on the inner surface of a common quartz crucible for the polycrystal cast ingot; painting a fine sand coating on the surface of the painted high-purity coating to reduce the roughness of the high-purity coating, sintering under a high temperature; painting a uniform compact nucleation source at the bottom of the crucible with the high-purity coating on the side. Based on a theory of controlling the nucleation long crystal, a layer of quartz sands with a certain granularity is creatively paved at the bottom of the crucible as the nucleation source to control the nucleation of the long crystal initial period, and an effective polycrystal silicon pellet the bottom of which has thin uniform crystal granules is formed. In the melting process, the silicon solution is fully melted, so that the rod-insertion melting test can be omitted and the process control difficulty is greatly reduced.

Publication: CN 104651931 A 20150527

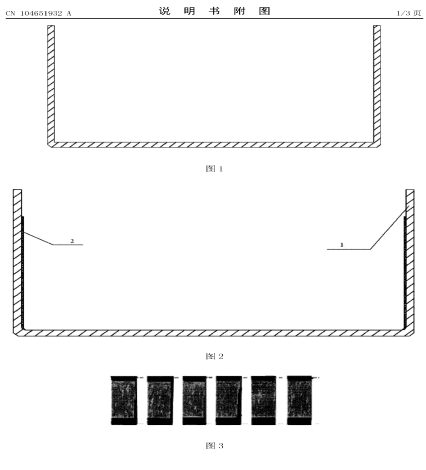
Applicant: JIANGSU MEIKE SILICON ENERGY CO LTD
Inventor: LIU MINGQUAN; WANG LUBAO
Prio:
Appl.No: CN201410594906
IPC: C30B 28/06

Polycrystalline quartz ceramic crucible and preparation method thereof

The invention provides a polycrystalline quartz ceramic crucible and a preparation method thereof; a coating is arranged on the inner wall of the polycrystalline quartz ceramic crucible provided by the invention; and the coating comprises quartz sand, the particle diameter of which is 10-150mu m. According to the invention, polycrystalline silicon ingot casting is carried out by adopting the quartz ceramic crucible having the quartz sand coating with the particle diameter of 10-150mu m; diffusion of impurity elements in the quartz ceramic crucible to the interior of a silicon ingot can be effectively reduced; the minority carrier lifetime of the silicon ingot is increased; the red-zone width of the silicon ingot is reduced; the EL (Electro Luminescence) detection black margin proportion after a silicon slice is prepared into a battery piece is reduced; the photoelectric conversion efficiency is increased; therefore, the quartz ceramic crucible can satisfy practical production requirements better; and experimental results show that the red-zone width of the polycrystalline cast ingot prepared by adopting the polycrystalline quartz ceramic crucible provided by the invention can be decreased to be below 10 mm, even 0 mm.

Publication: CN 104651932 A 20150527

Applicant: JIANGXI ZHONGYU NEW MATERIAL TECHNOLOGY CO LTD
Inventor: LOU HANGJIONG; QI PING; SU GUANGDU; WANG JUNWEI; YANG XIAOGANG; ZHENG PING
Prio:
Appl.No: CN201510116299
IPC: C30B 28/06

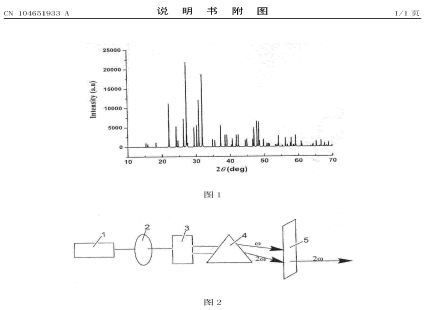


Chlorine barium borate, chlorine barium borate nonlinear optical crystal, and preparation method and uses of chlorine barium borate nonlinear optical crystal

The present invention relates to a compound chlorine barium borate, a chlorine barium borate nonlinear optical crystal, and a preparation method and uses of the chlorine barium borate nonlinear optical crystal. According to the present invention, the chemical formula of the compound is Ba7B3O11Cl, the molecular weight is 1205.26, and the compound is synthesized by adopting a solid phase reaction method; the chemical formula of the chlorine barium borate nonlinear optical crystal is Ba7B3O11Cl, the molecular weight is 1205.26, the crystal does not have the symmetry center and belongs to the hexagonal crystal system, the space group is P6[3]mc, and the cell parameters are as the follows: a is 11.2266 (17) angstrom, c is 7.214 (2) angstrom, Z is 2, and V is 787.4 (3) angstrom; the frequency doubling effect of the crystal powder achieves the 0.5 time of the KDP (KH2PO4); and the crystal has characteristics of large mechanical hardness, easy cutting, easy polish processing and easy preservation, and is widely applied in preparation of frequency doubling generators, frequency up-convertors, frequency down-convertors, or optical parameter oscillators and other nonlinear optical devices.

Publication: CN 104651933 A 20150527

Applicant: XINJIANG TECH INST PHYSICS CAS
Inventor: LI HONGYI; LU YI; PAN SHILIE; WU HONGPING; YU HONGWEI
Prio:
Appl.No: CN201310591017
IPC: C30B 29/10



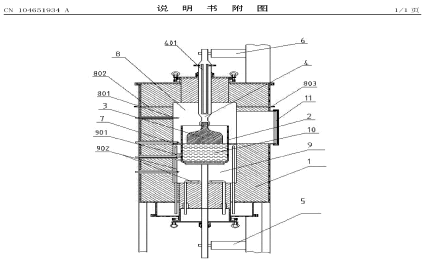
12

Energy-saving sapphire crystal growth furnace

The invention discloses an energy-saving sapphire crystal growth furnace. A crucible and a clamping rod used for clamping a seed crystal rod are arranged in a furnace chamber of the growth furnace and are controlled by a crucible lifting device and a seed crystal rod lifting device respectively to move up and down so as to ensure the liquid level of an alumina melt in the crucible in the crystal growth process to always keep at the same position; a partition plate is arranged in a furnace body to divide the furnace body into a cold air chamber and a hot air chamber, the cold air chamber, the hot air chamber, the seed crystal rod and the alumina melt form four temperature fields, the temperatures of the four temperature fields are regulated by virtue of monitoring of a thermocouple so as to enable the four temperature fields to have optimal temperature gradients, and thus the solid-liquid interface temperature is accurately controlled, the optimal thermal field mode for crystal growth is improved, the optimal way for crystal growth is found, and improvement of the growth speed and quality of crystals is facilitated.

Publication: CN 104651934 A 20150527

Applicant: LUOYANG SIGMA FURNACE CO LTD
Inventor: GUO JINWU; LI JIANGUO; WANG KE; ZHANG GUOHAO; ZHOU SEN AN
Prio: CN 20141017 201410551530
Appl.No: CN201510043615
IPC: C30B 29/20



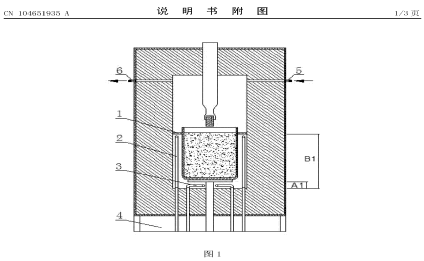
8

Method for preparing high-quality sapphire crystals by using crucible ascending method

The invention discloses a method for preparing high-quality sapphire crystals by using a crucible ascending method. The interior of a crystal growing furnace is divided into four temperature areas including a high-temperature area heated by a heating body, a melt temperature area of aluminum oxide melt in a crucible, an interface temperature area in which growing crystals in seed crystal rods are in contact with the melt and a low-temperature area in which the temperature is reduced by using cool air, according to the echelon change of the temperature from high to low; in a growing process of the crystals, the ascending speed of the crucible and the ascending speed of the seed crystal rods are controlled to ensure that the liquid level of the aluminum oxide melt in the crucible is consistent with the height of partition plates in the high-temperature area and the low-temperature area. According to the method, the interior of the furnace body is divided into four temperature areas; by monitoring and regulating the temperatures of the four temperature areas, the optimal temperature gradient is achieved, so that the solid-liquid interface temperature is accurately controlled, the optimal thermal field way of the growth of the crystals is improved, an optimal way of the growth of the crystals is found, and the growth speed and growth quality of the crystals are improved.

Publication: CN 104651935 A 20150527

Applicant: LUOYANG SIGMA FURNACE CO LTD
Inventor: GUO JINWU; LI JIANGUO; WANG KE; ZHENG CHUANTAO; ZHOU SEN AN
Prio: CN 20141017 201410551579
Appl.No: CN201510043662
IPC: C30B 29/20



Raw material formula of dopant sapphire crystal

The invention discloses a raw material formula of dopant sapphire crystal. The main active ingredient in the raw materials of the dopant sapphire crystal is Al2O3, dopants are Fe<3+>, Fe<2+> and Ti<4+>, the ratio of Al2O3 to Fe<3+> to Fe<2+> to Ti<4+> is equal to (90-100at%):(0-10at%):(0-10at%):(0-10at%). The raw material formula is reasonable and scientific, the sapphire crystal prepared by adopting the ratio is good in quality, the finished rate is high, the color developing is stable, and the sapphire is crystal and transparent, and bright in color, thus being suitable for growth of large-size decorative sapphire crystal; the technology is simple and easy to operate, low in cost, suitable for large-scale production and wide in market prospects.

Publication: CN 104651936 A 20150527

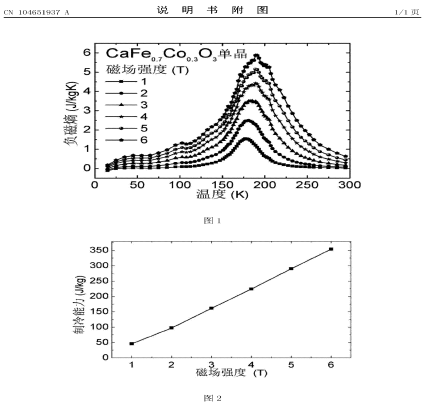
Applicant: BENGBU NUODE TECHNOLOGY CO LTD
Inventor: ZHAO ZHIWEI
Prio:
Appl.No: CN201510062826
IPC: C30B 29/20

Magnetic refrigeration material CaFe0.7Co0.3O3 single crystal and preparation method thereof

The invention provides a magnetic refrigeration material which has a chemical formula of CaFe0.7Co0.3O3. The invention also provides a method for preparing the magnetic refrigeration material. The method comprises the following steps: uniformly mixing CaCO3, Fe2O3 and Co3O4 and grinding; sintering for the first time; grinding the product obtained by sintering at the first time, and pressing the ground product into a rod shape; sintering for the second time, thereby obtaining a CaFe0.7Co0.3O2.5 polycrystalline rod; and by taking the CaFe0.7Co0.3O2.5 polycrystalline rod as a charging bar, growing the CaFe0.7Co0.3O2.5 single crystal by virtue of an optical floating-zone method, wherein a high-temperature high-pressure reaction is carried out between the CaFe0.7Co0.3O2.5 single crystal and an oxygen source. The CaFe0.7Co0.3O3 single crystal provided by the invention has an excellent magnetocaloric effect, is wide in working temperature range and high in refrigerating capacity, does not contain precious metal elements and is suitable for a high-efficiency magnetic refrigeration device.

Publication: CN 104651937 A 20150527

Applicant: CHINESE ACAD PHYSICS INST
Inventor: LONG YOUWEN; XIA HAILIANG; YANG JUNYE; YIN YUNYU
Prio:
Appl.No: CN201510068308
IPC: C30B 29/22



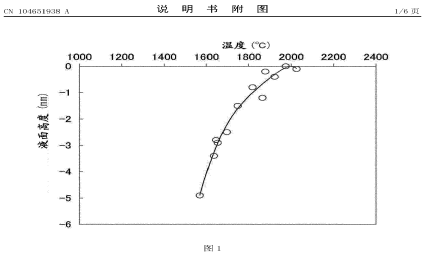
6

Method for producing SiC single crystal

Provided is a method for producing a SiC single crystal wherein generation of polycrystals can be inhibited even if the temperature of the Si-C solution is changed after seed touching. This is achieved by a method for producing a SiC single crystal wherein a SiC seed crystal substrate held on a seed crystal holding shaft is contacted with a Si-C solution having a temperature gradient in which the temperature decreases from the interior toward the surface, to grow a SiC single crystal, comprising the steps of: (A) bringing the temperature of the solution to a first temperature, (B) contacting the substrate held on the holding shaft with the solution, (C) bringing the temperature of the solution to a second temperature after the contacting the substrate with the solution, and (D) moving the substrate held on the holding shaft in the vertical direction according to the change in liquid surface height of the solution when the temperature of the solution is brought from the first temperature to the second temperature.

Publication: CN 104651938 A 20150527

Applicant: NIPPON STEEL AND SUMITOMO METAL CORP; TOYOTA MOTOR CO LTD
Inventor: DANNO KATSUNORI; KAMEI KAZUHITO; KUSUNOKI KAZUHIKO
Prio: JP 20131121 2013241086
Appl.No: CN201410671057
IPC: C30B 29/36



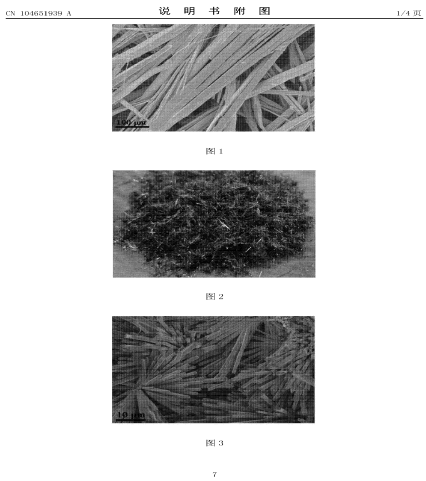
16

Method for preparing antimony sulphoioide single crystal and similar compound single crystal

The invention discloses a method for preparing an antimony sulphoioide single crystal and a similar compound single crystal. The method comprises the following steps: dissolving the soluble metal salts of the antimony, bismuth, copper, silver, lead or tin, the sulphur source and the iodine source according to a mol ratio of 1:1:(1-5) in a hydrochloric acid solution with the concentration of 0.5-2.4 mol/L, reacting in a high pressure kettle for 2-20 hours at 140-300 DEG C, separating, washing and drying to obtain a rod-like metal glossy crystal. The method is mild in condition, short in reaction time and small in reaction pressure, so that the growing time for synthesizing the antimony sulphoioide single crystal is shortened, the reaction temperature is reduced, the energy consumption is saved, and the purity, the crystallinity, the crystal size, the crystal quality and the crystal morphology of the antimony sulphoioide and the similar compound single crystal can be adjusted through adjusting the dosage and the concentration of the acid; and the method is simple in process operation, low in cost, high in crystal yield and can be used for large-scale industrial production.

Publication: CN 104651939 A 20150527

Applicant: USTC UNIV SCIENCE TECH CN
Inventor: CHEN GUIHUAN; LI WEI; YANG QING
Prio:
Appl.No: CN201510083592
IPC: C30B 29/46



7

Method for growing tungsten ditelluride single crystals by using vapor transport process

The invention provides a method for growing tungsten ditelluride single crystals by using a vapor transport process. The method comprises the following step: by taking tungsten ditelluride polycrystalline powder with the purity over 3N as a raw material, putting tungsten ditelluride polycrystallines and a transfer agent (I2 or TeCl4 and the like) in a three-temperature-region furnace for vapor transport reaction so as to obtain high purity tungsten ditelluride single crystals.

Publication: CN 104651940 A 20150527

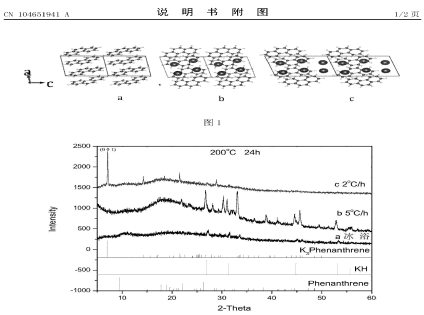
Applicant: ANQING BEAUTIFUL CRYSTAL NEW MATERIAL CO LTD
Inventor: QIU JUN; ZHANG ZHIMING
Prio:
Appl.No: CN201510090508
IPC: C30B 29/46

Potassium-doped phenanthrene molecular crystal and preparation method thereof

The invention provides a potassium-doped phenanthrene molecular crystal and a preparation method thereof. In the first aspect, the preparation method comprises the following steps: annealing under high-vacuum, anhydrous and anaerobic conditions, and controlling the annealing temperature and cooling rate to ensure that potassium atoms can be effectively doped into phenanthrene molecular crystal layers and among the phenanthrene molecular crystal layers, the c-axis length of a phenanthrene molecular crystal can be increased, and a high-quality crystal material with very good [001] oriented growth can be obtained; in the second aspect, the production of impurities such as potassium hydride can be effectively inhibited by controlling the annealing temperature and cooling rate, the high-purity potassium-doped phenanthrene molecular crystal can be obtained, and superconducting fractions of materials can be increased; and in the third aspect, the potassium atoms can be synchronously doped into the phenanthrene molecular crystal layers and among the phenanthrene molecular crystal layers so as to ensure that phenanthrene can be transformed into a stable metal state from a semiconductor state, and the superconduction critical temperature can be increased.

Publication: CN 104651941 A 20150527

Applicant: UNIV HUBEI
Inventor: GAO YUN; HUANG ZHONGBING; WANG RENSHU; WU XIAOLIN; YAN XUNWANG
Prio:
Appl.No: CN201510055398
IPC: C30B 29/54

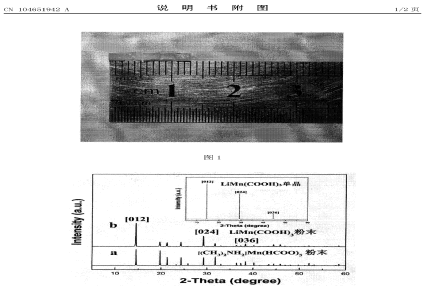


Multiferroic formate LiMn(COOH)3 single crystal material and preparation method thereof

The invention discloses a multiferroic formate LiMn(COOH)3 single crystal material and a preparation method thereof. The multiferroic formate LiMn(COOH)3 single crystal material is formed by LiMn(COOH)3 single crystal of which the size is 2.0*2.0*1.0mm<3> to 2.5*2.5*1.5mm<3>; the LiMn(COOH)3 single crystal is colorless transparent crystal; and a chemical formula of a LiMn(COOH)3 single crystal compound is LiMn(COOH)3. The used reagent is a commercial product in a preparation process; fussy preparation is not needed; the single crystal with a large size is obtained by combining a hydrothermal method with a liquid-phase method; the technology is high in controllability and easy to operate; and the prepared product is high in purity. The obtained lithium formate manganese single crystal material, and is hoped to be widely applied to a novel metal-organic frame semiconductor, information storage and optical apparatus; and meanwhile, the preparation method of the LiMn(COOH)3 is simple and convenient.

Publication: CN 104651942 A 20150527

Applicant: WANG JUNLIU
Inventor: WANG JUNLIU
Prio:
Appl.No: CN201510102057



IPC: C30B 29/54

Barium sulfate whisker and preparation method thereof

The invention relates to a barium sulfate whisker and a preparation method of the barium sulfate whisker. The barium sulfate whisker is prepared by utilizing the influence on the growth of the barium sulfate whisker by an electric field and a crystal form controlling agent. The barium sulfate whisker is high in weather resistance and anti-aging property; moreover, the abrasion property and the anti-impact strength of the product can be increased, and the toughness of the product is obviously improved; the preparation method is simple, low in cost and easy for industrial production.

Publication: CN 104651943 A 20150527

Applicant: CHENGDU NEW KELI CHEM SCI CO
Inventor: CHEN QING; LI XINGWEN
Prio:
Appl.No: CN201510034577
IPC: C30B 29/62

Preparation method of calcium-sulfate-based calcium sulfate crystal whisker

The invention discloses a preparation method of calcium-sulfate-based calcium sulfate crystal whisker. The method mainly comprises the following steps: (1) milling and drying the calcium sulfate raw material; (2) recrystallizing the calcium sulfate crystal whisker by program-controlled heating; (3) separating and pretreating the calcium sulfate crystal whisker; (4) carrying out surface modification; (5) separating and washing; and (6) drying. The method is simple to operate, and has the advantages of favorable product adsorbability, wide raw material sources, lower cost and the like. The prepared adsorbent can be used in the purification process of multiple heavy metals in industrial flue gas or water bodies, and can obtain the purification efficiency of higher than 85% for the flue gas or water body with medium/low-concentration heavy metals.

Publication: CN 104651944 A 20150527

Applicant: UNIV XIANGTAN
Inventor: CHEN MIN; DING RUNMEI; HUANG YAN; YANG LIUCHUN; ZHANG JUNFENG
Prio:
Appl.No: CN201510075026
IPC: C30B 29/62

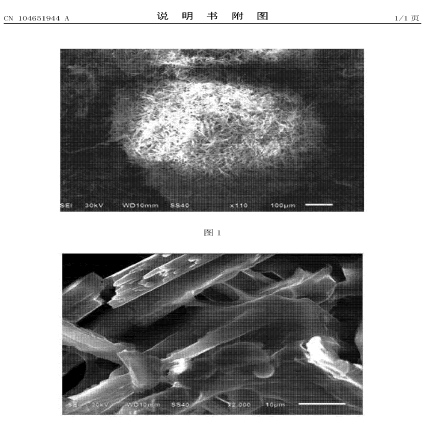


图 1

图 2

Method for modifying calcium sulphate whisker surface

The invention discloses a method for modifying a calcium sulphate whisker surface. The method comprises the following steps: (1) adding a calcium sulphate whisker into deionized water, stirring, pouring the obtained calcium sulphate whisker solution into an ultrasonic dispersing instrument and oscillating, wherein the mass rate of the calcium sulphate whisker to the deionized water is 1:9; (2) adding sodium aluminate into the oscillated calcium sulphate whisker solution, and performing chemical coating reaction, wherein the mass rate of the sodium aluminate to the calcium sulphate whisker is 1:(10-100). The calcium sulphate whisker surface is subjected to modification treatment, and the modified calcium sulphate whisker is used as a stuffing in a paper-making process, so that the retention rate in the paper reaches the level of calcium carbonate stuffing, the physical and chemical performances of the obtained paper are excellent, and the influence on popularization and application of the calcium sulfate whisker in the paper-making industry can be avoided.

Publication: CN 104651945 A 20150527

Applicant: GONG MURONG; JIANGSU EFFUL SCIENCE AND TECHNOLOGY CO LTDD

Inventor: DING DAWU; GONG MURONG; XU HONGYING

Prio:

Appl.No: CN201510036055

IPC: C30B 33/00

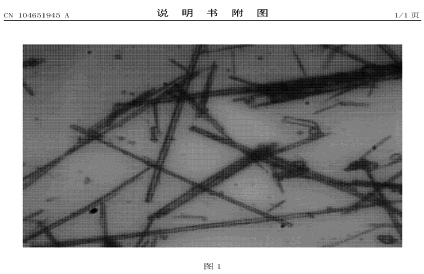


图 1

7

Silicon waveguide surface smoothing process based on silicon hydrogen bond current density method

The invention relates to a silicon-based nano-optical waveguide surface smoothing process comprising the steps of carrying out rapid high-temperature annealing treatment at the hydrogen atmosphere to form Si-H bonds on a silicon waveguide surface; and then, realizing waveguide side wall sub-nanoscale smoothing treatment by virtue of the tendency that a hydrogen ion surface current density vector is migrated from a high-energy state to a low-energy state. Compared with the existing surface treatment method, the silicon-based nano-optical waveguide surface smoothing process is not only better in effect, but also convenient and efficient; and meanwhile, batch treatment can also be realized, and the silicon-based nano-optical waveguide surface smoothing process has important theory and application values.

Publication: CN 104651946 A 20150527

Applicant: UNIV TAIYUAN TECHNOLOGY

Inventor: DENG LILI; DUAN QIANQIAN; JI JIANLONG; JIAN AOQUN; REN XINYU; SANG SHENGBO; ZHANG HUI; ZHANG WENDONG

Prio:

Appl.No: CN201510120698

IPC: C30B 33/02

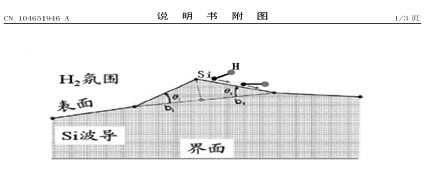


图 1

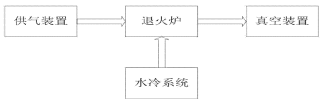


图 2

6

Silicon rod gluing device with slantwise adjustable transverse base and use method of silicon rod gluing device

The invention provides a silicon rod gluing device with a slantwise adjustable transverse base. The silicon rod gluing device comprises a vertical base rack, a glass cushion strip limiting component, a positioning screw and a lifting device, wherein the lifting device is adjusted so that the inclination angle between the transverse base and a worktable can be changed, in other words, the lifting device is capable of randomly adjusting the inclination angle between the transverse base and the horizontal plane within the range of 0-45 degrees; as a result, each silicon ingot is uniformly limited by the transverse base and the positioning screw and can be prevented from sliding outwards from the surface of a glass cushion strip; local support failure between the silicon ingot and the glass cushion strip can be avoided, and the silicon ingot also does not slide outwards by virtue of a rod glue on the upper surface of the glass cushion strip. After the gluing of the silicon ingot is completed, the transverse base is put down into the horizontal state by use of the lifting device, so that the combined part of the silicon ingot and a crystal holder can be shifted convenient; the silicon rod gluing device is capable of ideally solving the defects of the prior art.

Publication: CN 104651947 A 20150527

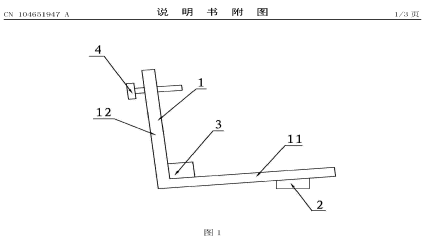
Applicant: GUODIAN ZHAOJING OPTOELECTRONICS TECHNOLOGY JIANGSU CO LTD

Inventor: FU ZHENDONG; LIU PING; TAN JUN; TANG HAIBO; WANG DEMING

Prio:

Appl.No: CN201510021401

IPC: C30B 33/06



Method for etching c-plane sapphire

The invention discloses a method for etching c-plane sapphire. The method comprises the following steps: firstly immersing c-plane sapphire in a mixed solution consisting of hydrofluoric acid and water at 25 DEG C for 20 minutes, then taking out the c-plane sapphire, sequentially performing alcohol washing, supersonic washing and drying to obtain c-plane sapphire treated by hydrofluoric acid; then immersing the c-plane sapphire treated by the hydrofluoric acid in a mixed acid consisting of concentrated sulfuric acid and concentrated phosphoric acid for 20 minutes, naturally cooling, taking out the c-plane sapphire and sequentially performing alcohol washing, supersonic washing and drying to obtain c-plane sapphire treated by the mixed acid; and finally putting the c-plane sapphire treated by the mixed acid in a melting solution of flaky NaOH at the temperature of 325-340 DEG C for 10 minutes, taking out the c-plane sapphire and sequentially performing alcohol washing, supersonic washing and drying to finish the etching of the c-plane sapphire. The method for etching the c-plane sapphire disclosed by the invention has the advantages of good etching effect, good uniformity, good quality, high yield and the like.

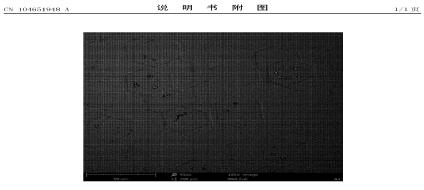
Publication: CN 104651948 A 20150527

Applicant: SHANGHAI INST TECHNOLOGY

Inventor: FANG YONGZHENG; LI LONG; ZOU JUN

Prio:

Appl.No: CN201510013477



IPC: C30B 33/10

Multi-crystalline silicon wafer texturization additive

The invention discloses a multi-crystalline silicon wafer texturization additive, which comprises the following components in percentage by mass: 0.08-0.8% of sodium citrate, 1.0-2.5% of citric acid, 0.03-0.07% of non-ionic surfactant, 0.08-0.8% of polyethylene glycol, 0.1-1% of polyvinylpyrrolidone and the balance of water. After being texturized through using the prepared multi-crystalline silicon wafer texturization additive, the multi-crystalline silicon wafer has an even surface, the reflective rate is reduced by 3-5%, and a battery conversion rate is promoted by 0.1-0.2%.

Publication: CN 104651949 A 20150527

Applicant: CHANGZHOU JUNHE TECHNOLOGY STOCK CO LTD

Inventor: FEI TING; LU YOUDONG; NI LIPING; ZHAO HAIJING

Prio:

Appl.No: CN201510072360

IPC: C30B 33/10

Pulling a semiconductor single crystal according to the Czochralski method and silica glass crucible suitable therefor

In a known method for pulling a semiconductor single crystal according to the Czochralski method, a semiconductor melt is produced in a silica glass crucible and the semiconductor single crystal is pulled from said melt. The inner wall of the silica glass crucible and the exposed melt surface are in contact with one another and with a respective melt atmosphere in the region of a contact zone running radially around the crucible inner wall, and primary oscillations of the melt are triggered in said contact zone. On this basis, in order to provide a method characterized by reduced melt vibrations and in particular by a simple, short accretion process, according to the invention primary oscillations are triggered which differ from one another in their frequency.

Publication: CN 104662210 A 20150527

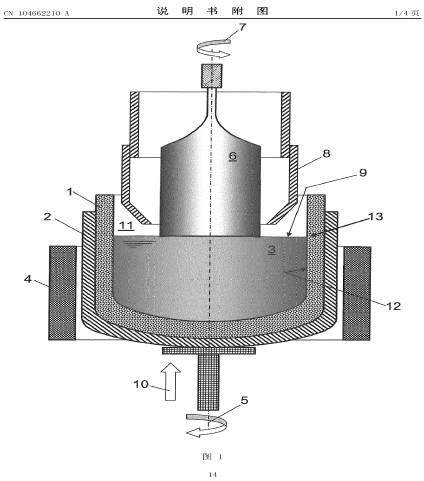
Applicant: HERAEUS QUARZGLAS

Inventor: HUENERMANN MICHAEL; KAYSER THOMAS; LEHMANN WALTER

Prio: DE 20120927 102012109181, EP 20130917 2013069234

Appl.No: CN201380050766

IPC: C30B 15/10



Single crystal production device, crucible used in same, and single crystal production method

A production device (10) used in the production of single crystals that uses a solution growth method. The production device (10) comprises a seed shaft (28), a crucible (14), and a drive source (26). The seed shaft has a bottom end surface (28S) to which a seed crystal (32) is attached. The crucible (14) houses a solution (15) that serves as the raw material for single crystals. The drive source (26) rotates the crucible (14) and changes the rotation speed of the crucible (14). The inner circumferential surface of the crucible (14) includes a flow control surface (382) having a non-circular transverse shape. This production device for single crystals is capable of strongly agitating the solution housed in the crucible.

Publication: CN 104662211 A 20150527

Applicant: NIPPON STEEL & SUMITOMO METAL CORP; TOYOTA MOTOR CO LTD

Inventor: DAIKOKU HIRONORI; KADO MOTOHISA; KAMEI KAZUHITO; KUSUNOKI KAZUHIKO; MORIGUCHI KOJI; OKADA NOBUHIRO; SAKAMOTO HIDEMITSU; YASHIRO NOBUYOSHI

Prio: JP 20120904 2012194250, JP 20130830 2013005131

Appl.No: CN201380046191

IPC: C30B 17/00

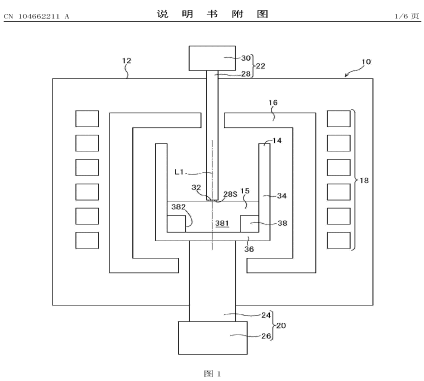


图 1

11

Substrate for epitaxial growth, manufacturing method therefor, and substrate for superconductor wire

The objective of the present invention is to provide a copper substrate for epitaxial growth which has a more advanced biaxial crystal orientation and a manufacturing method therefor. This substrate for epitaxial growth comprises a copper layer that is biaxially crystal oriented, the substrate being characterized in that the half-value width [Delta][Phi] of a peak based on a pole figure of the copper layer is 5 degrees or less and the skirt width [Delta][beta] of a peak based on the pole figure is 15 degrees or less. This kind of substrate for epitaxial growth is manufactured by a first step of performing heat treatment of the copper layer such that [Delta][Phi] is 6 degrees or less and the skirt width [Delta][beta] is 25 degrees or less, and after the first step, a second step of performing heat treatment of the copper layer at a higher temperature than the heat treatment of the first step such that [Delta][Phi] is 5 degrees or less and the skirt width [Delta][beta] is 15 degrees or less.

Publication: CN 104662212 A 20150527

Applicant: SUMITOMO ELECTRIC INDUSTRIES; TOYO KOHAN CO LTD

Inventor: KOSHIRO TAKASHI; KUROKAWA TEPPEI; NANBU KOUJI; OKAYAMA HIRONAO

Prio: JP 20121005 2012223187, JP 20130823 2013072520

Appl.No: CN201380050056

IPC: C30B 29/22

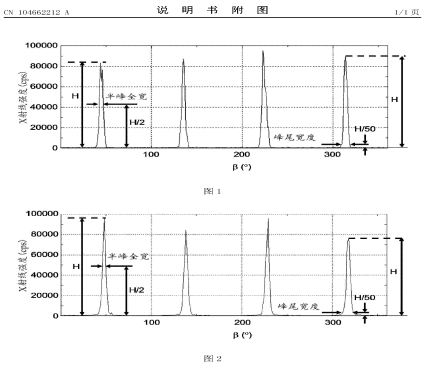


图 1

图 2

12

Apparatus and method for manufacturing SiC single crystal

This apparatus (10) for manufacturing a SiC single crystal is used for manufacturing a SiC single crystal by a solution growth method and comprises a seed shaft (22A) having a lower end face (22S) to which a SiC seed crystal (32) is attached, a crucible (14) which stores a SiC solution (15), a stirring member (24A) which is immersed in the SiC solution (15), and driving sources (20B, 24D) which relatively rotate one of the crucible (14) and the stirring member (24A) with respect to the other. The lower end of the stirring member (24A) is disposed at a position that is lower than the lower end (32a) of the SiC seed crystal (32) which is attached to the lower end face (22S) of the seed shaft (22A).

Publication: CN 104662213 A 20150527

Applicant: NIPPON STEEL & SUMITOMO METAL CORP; TOYOTA MOTOR CO LTD

Inventor: DAIKOKU HIRONORI; KADO MOTOHISA; KAMEI KAZUHITO; KUSUNOKI KAZUHIKO; MORIGUCHI KOJI; OKADA NOBUHIRO; SAKAMOTO HIDEMITSU; YASHIRO NOBUYOSHI

Prio: JP 20120904 2012193725, JP 20130902 2013005168

Appl.No: CN201380046179

IPC: C30B 29/36

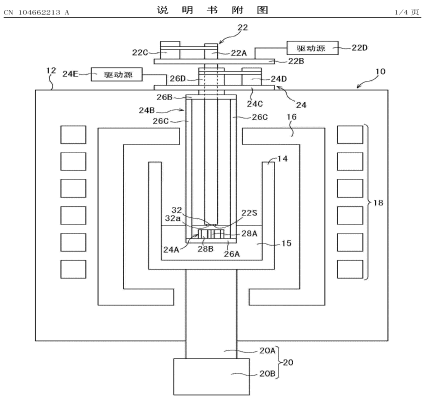


图 1

13

Method for preparing high-resistivity silicon chip

Publication: CN 101935873 B 20150520

Applicant: SHANGHAI GRACE SEMICONDUCTOR

Inventor: LI PO; MAN NIU ER

Prio:

Appl.No: CN201010278602

IPC: C30B 29/06

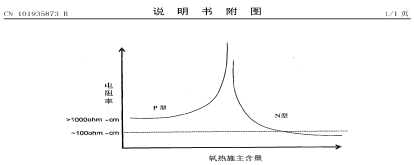


图 1

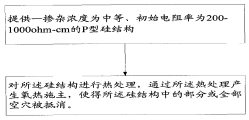


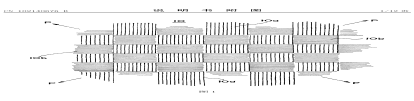
图 2

5

Carbon fiber reinforced carbon composite crucible and manufacturing method of the same

Publication: CN 102140676 B 20150527

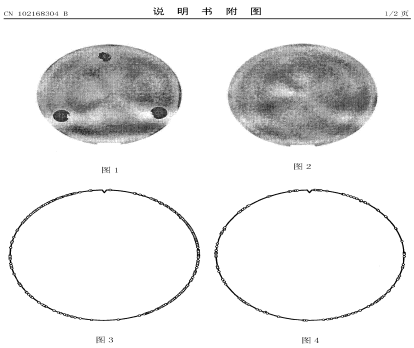
Applicant: COVALENT MATERIALS CORP



Inventor: MORITAKA KAZU; OKAWA MASAYUKI; SOTOTANI EIICHI; TSUSHIMA SHIGEKI; YOSHIMITSU HIROSHI
Prio: JP 20100201 2010019911, JP 20100930 2010222466
Appl.No: CN201110037106
IPC: C30B 15/10

Method for producing a semiconductor wafer composed of silicon with an epitaxially deposited layer

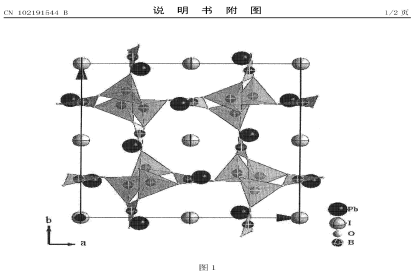
Publication: CN 102168304 B 20150527
Applicant: SILTRONIC AG
Inventor: HAGER CHRISTIAN; LOCH THOMAS; WERNER NORBERT
Prio: DE 20100203 102010006725
Appl.No: CN201110031205
IPC: C30B 25/12



7

Inorganic nonlinear optical material lead iodo-borate crystal, and preparation method and application thereof

Publication: CN 102191544 B 20150513
Applicant: FUJIAN INST RES STR MATTER CAS
Inventor: CHEN LING; HUANG YIZHI; WU LIMING; WU XINTAO
Prio:
Appl.No: CN201010116351
IPC: C30B 29/12



5

Nonlinear optical crystals cadmium diethyldithiocarbamate aluminum hexaborate and preparation method and application thereof

Publication: CN 102191550 B 20150513

Applicant: FUJIAN INST RES STR MATTER CAS
Inventor: YANG GUOYU; ZHOU JIAN
Prio:
Appl.No: CN201010116297
IPC: C30B 29/32

Non-linear optical crystals dimethylammonium aluminum pentaborate dehydrate and preparation method and application thereof

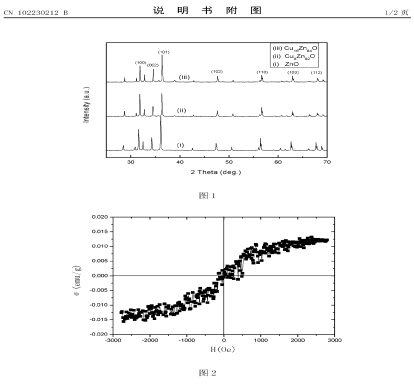
Publication: CN 102191558 B 20150513

Applicant: FUJIAN INST RES STR MATTER CAS
Inventor: CAO GAOJUAN; YANG GUOYU
Prio:
Appl.No: CN201010116241
IPC: C30B 29/54

Method for preparing zinc oxide copper-doped room temperature magnetic semiconductor

Publication: CN 102230212 B 20150520

Applicant: UNIV QUANZHOU NORMAL
Inventor: GE YONGMING; HUANG WEIWEI; LIN WEN; WANG FENG; ZHANG XIAOTING
Prio:
Appl.No: CN201110171037
IPC: C30B 1/10



Preparation method of cerium-doped lanthanum chlorobromide scintillating crystal

Publication: CN 102230215 B 20150513

Applicant: UNIV JILIANG CHINA
Inventor: CHAI WENXIANG; GUO JIAYU; HUANG YUEXIANG; QIN LAISHUN; SHEN HANGYAN; SHI HONGSHENG; SHU KANGYING
Prio:
Appl.No: CN201110177572
IPC: C30B 11/00

Polycrystalline group III metal nitride with getter and method of making

Publication: CN 102282298 B 20150513

Applicant: SORAA INC
Inventor: D EVELYN MARK P
Prio: US 20091211 2009067745, US 20081212 12233208, US 20091209 63466509
Appl.No: CN200980154756
IPC: C30B 25/00

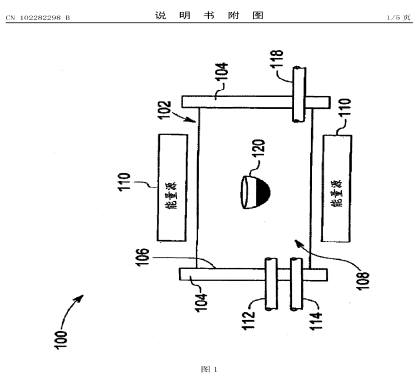


图 1

22

Crucible used for polycrystalline silicon ingot casting and preparation method thereof

Publication: CN 102409394 B 20150520

Applicant: SUZHOU NANODISPERSIONS LTD
Inventor: WANG YUHU
Prio:
Appl.No: CN201110397705
IPC: C30B 11/00

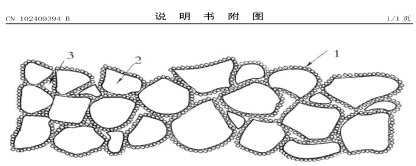


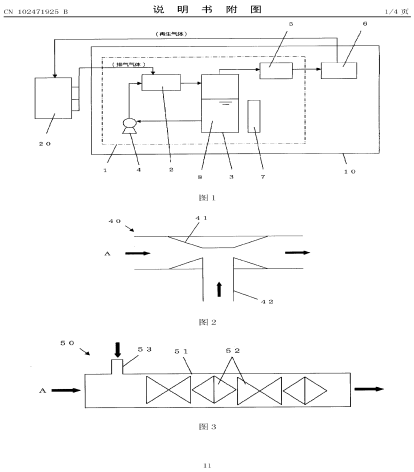
图 1

10

Silicon oxide removal apparatus, and inert gas collection facility for silicon monocrystal production apparatus

Publication: CN 102471925 B 20150527

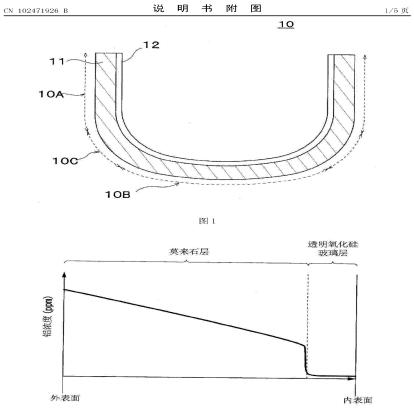
Applicant: SHINETSU HANDOTAI K K
Inventor: HIGUCHI TAKASHI; HORIUCHI TADAHIKO
Prio: JP 20090806 2009183091, JP 20091009 2009235008, JP 20100527 2010003548
Appl.No: CN201080035023
IPC: C30B 29/06



Composite crucible, method for producing same, and method for producing silicon crystal

Publication: CN 102471926 B 20150506

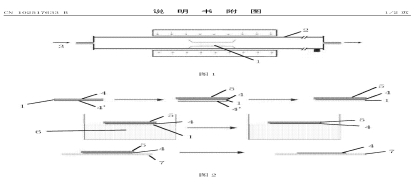
Applicant: JAPAN SUPER QUARTZ CORP
Inventor: FUJITA TAKESHI; KANDA MINORU; KISHI HIROSHI; KITAHARA KEN; SUDO TOSHIAKI; SUZUKI KOICHI; YOSHIOKA TAKUMA
Prio: JP 20090909 2009208606, JP 20100820 2010064056
Appl.No: CN201080037429
IPC: C30B 29/06



Scaffold for graphene growing, and method thereof

Publication: CN 102517633 B 20150520

Applicant: 2D CARBON CHANGZHOU TECH CO LTD
Inventor: JIN HU; PENG PENG
Prio:
Appl.No: CN201110442121

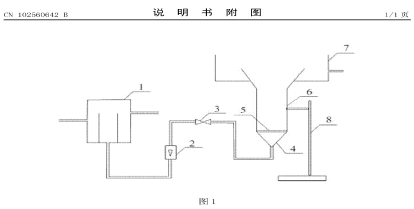


IPC: C30B 25/12

Method for assembling multi-colloid photonic crystals through particle fluidization

Publication: CN 102560642 B 20150506

Applicant: UNIV BEIJING JIAOTONG
Inventor: XU XIAOLONG; ZHANG HUI
Prio:
Appl.No: CN201110428500
IPC: C30B 29/00

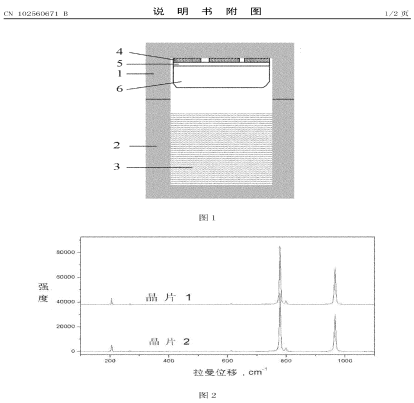


8

Semi-insulating silicon carbide mono-crystal

Publication: CN 102560671 B 20150527

Applicant: CHINESE ACAD PHYSICS INST
Inventor: CHEN XIAOLONG; LI LONGYUAN; LIU CHUNJUN; LIU YU; PENG TONGHUA; WANG GANG
Prio:
Appl.No: CN201010617348
IPC: C30B 29/36

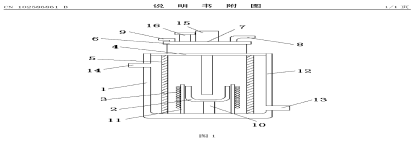


9

Sapphire single crystal furnace

Publication: CN 102586861 B 20150513

Applicant: ANHUI JIANGWEI PREC MFG CO LTD
Inventor: JIANG HAO; LUO FANGXU; ZHANG BOQIN
Prio:
Appl.No: CN201210044188



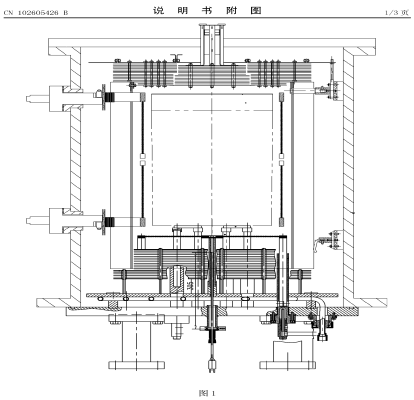
8

IPC: C30B 15/00

Thermal field structure for generating temperature difference in ultra-high temperature state

Publication: CN 102605426 B 20150513

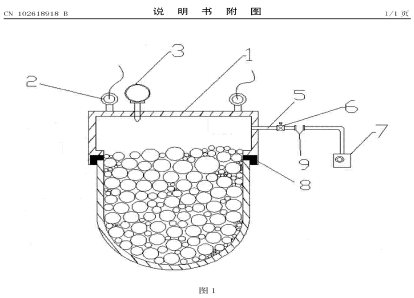
Applicant: SUZHOU ADVANCED RARE METAL CO LTD
Inventor: HOU BINGQIANG; LI JIAN
Prio:
Appl.No: CN201210066029
IPC: C30B 29/20



Crucible hoisting device

Publication: CN 102618918 B 20150506

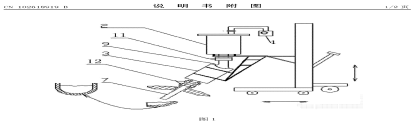
Applicant: HANGZHOU BENBO TECHNOLOGY CO LTD
Inventor: LEI SHIYOU; ZHANG SONGHUA
Prio:
Appl.No: CN201210064903
IPC: C30B 15/00



Charging device for single crystal furnace

Publication: CN 102618919 B 20150506

Applicant: HANGZHOU BEN BO TECHNOLOGY CO LTD
Inventor: LEI SHIYOU; ZHANG SONGHUA
Prio:
Appl.No: CN201210065031



IPC: C30B 15/00

Heat preservation device of sapphire crystal growth furnace

Publication: CN 102677169 B 20150527

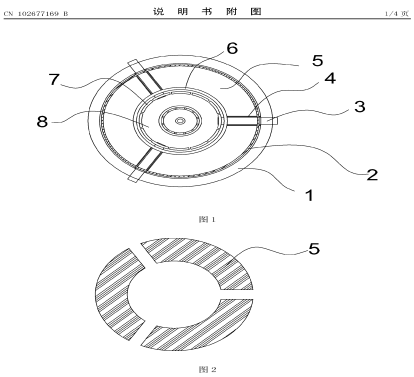
Applicant: ZHEJIANG SHANGCHENG SCIENCE & TECHNOLOGY CO LTD

Inventor: LUO QINGBO; WU YUNCAI; YU XIGAO; ZHOU GUOQING; ZHOU LIN

Prio:

Appl.No: CN201210122488

IPC: C30B 29/20



6

Vertical silicon carbide high-temperature oxidation device

Publication: CN 102691109 B 20150520

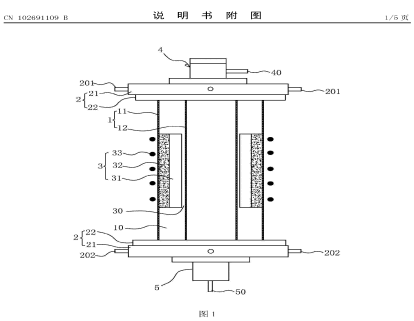
Applicant: DONGGUAN TIANYU SEMICONDUCTOR TECHNOLOGY CO LTD

Inventor: DONG LIN; LIU XINGFANG; SUN GUOSHENG; WANG LEI; YAN GUOGUO; ZHAO WANSHUN; ZHENG LIU

Prio:

Appl.No: CN201210203696

IPC: C30B 33/00



8

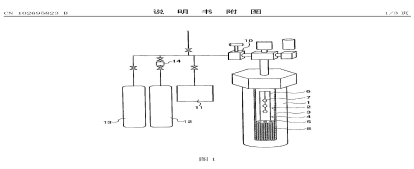
Method for producing nitride crystals, and production vessel and members

Publication: CN 102695823 B 20150527

Applicant: JAPAN STEEL WORKS LTD; MITSUBISHI CHEM CORP; UNIV TOHOKU

Inventor: ISHIGURO TORU; KAGAMITANI YUJI; KIYOMI MAKIKO; MIKAWA YUTAKA; YAMAMURA YOSHIHIKO

Prio: JP 20091127 2009269777, JP 20101125 2010071041



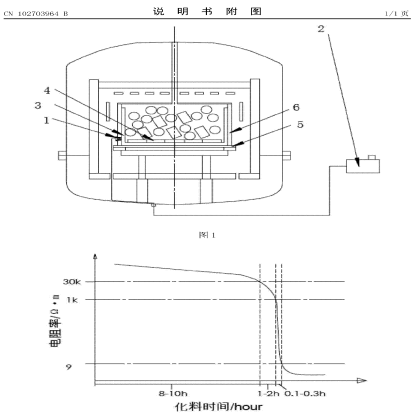
21

Appl.No: CN201080053298
IPC: C30B 29/38

Production method of ingot single crystal

Publication: CN 102703964 B 20150506

Applicant: CHANGZHOU TRINA SOLAR ENERGY
Inventor: CHEN XUE; HUANG ZHENFEI; YE HONGLIANG
Prio:
Appl.No: CN201210141373
IPC: C30B 11/00

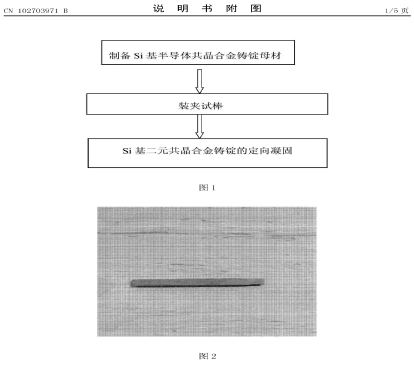


6

Method for preparing Si-based binary eutectic in-situ composites

Publication: CN 102703971 B 20150527

Applicant: UNIV NORTHWESTERN POLYTECHNIC
Inventor: FU HENGZHI; LIU LIN; SU HAIJUN; YANG XINYU; ZHANG JUN
Prio:
Appl.No: CN201210179010
IPC: C30B 21/04



12

Method for preparing p-type zinc oxide material

Publication: CN 102719893 B 20150513

Applicant: FUJIAN MATTER STRUCTURE
Inventor: CHEN DAGUI; DING KAI; HUANG FENG; HUANG JIAKUI; HUANG JIN; LIN WENWEN; ZHAN ZHIBING; ZHANG JIYE; ZHENG QINGHONG
Prio:

Appl.No: CN201210201820
IPC: C30B 31/00

Method for preparing two-dimensional atomic crystal new material by supercritical fluid

Publication: CN 102732966 B 20150520

Applicant: UNIV SHANGHAI JIAOTONG
Inventor: WANG WUCONG; WANG YAN; XIN NA; ZHAO YAPING; ZHOU CHENGHONG
Prio:
Appl.No: CN201210226272
IPC: C30B 30/06

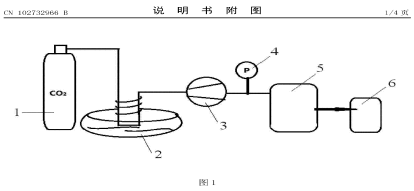


图 1

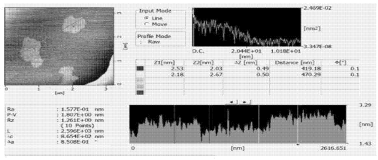


图 2

8

Quartz crucible for ingot casting

Publication: CN 102747413 B 20150506

Applicant: CHANGZHOU TRINA SOLAR ENERGY
Inventor: NIU YINGXI
Prio:
Appl.No: CN201210205975
IPC: C30B 11/00

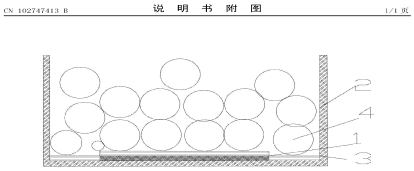


图 1

6

Method for growing large-size high-temperature oxide crystal through for top-seeded temperature gradient technique

Publication: CN 102758255 B 20150527

Applicant: UNIONLIGHT TECHNOLOGY CO LTD
Inventor: HUANG XIAOWEI; LIU ZHUPING; PEI GUANGQING

Prio:
Appl.No: CN201210272246
IPC: C30B 29/16

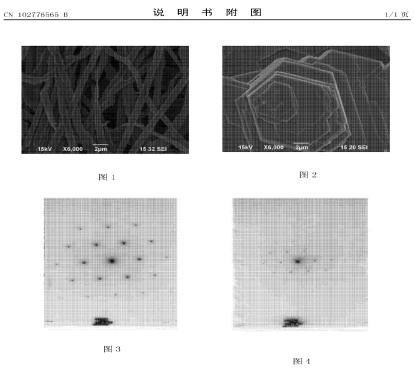
Method for preparing nano-structure single crystal silver

Publication: CN 102776565 B 20150520

Applicant: SHANGHAI YIDU DIGITAL TECHNOLOGY CO LTD; UNIV SHANGHAI JIAOTONG

Inventor: LAI YIJIAN; NING YUESHENG; WANG FEI; WANG LEI; ZHAO BINYUAN; ZHAO HONG; ZHOU JIE

Prio:
Appl.No: CN201210297462
IPC: C30B 29/02



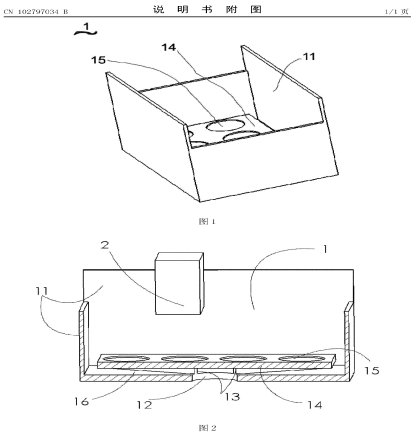
Support boat for GaN material epitaxy industrialization

Publication: CN 102797034 B 20150520

Applicant: SINO NITRIDE SEMICONDUCTOR CO; UNIV BEIJING

Inventor: BI LYUYAN; LIU PENG; SUN YONGJIAN; TONG YUZHEN; YUAN ZHIPENG; ZHANG GUOYI; ZHANG JUNYE; ZHAO HONGJUN

Prio:
Appl.No: CN201210309119
IPC: C30B 25/12



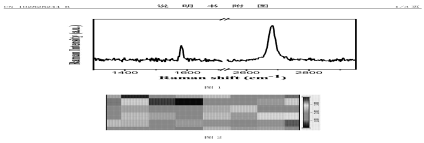
Layer-number-controllable graphite film based on nickel-copper composite substrate and preparation method of film

Publication: CN 102828244 B 20150527

Applicant: SHANGHAI INST MICROSYS & INF

Inventor: DING GUQIAO; JIANG MIANHENG; XIE XIAOMING; ZHU YUN

Prio:

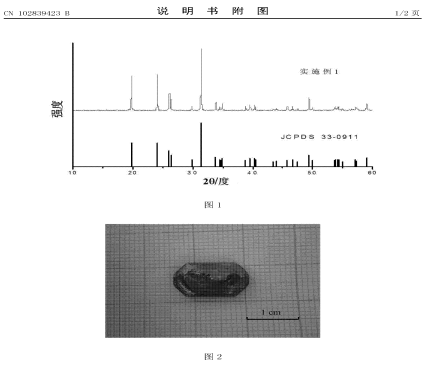


Appl.No: CN201210359830
IPC: C30B 29/06

Infrared nonlinear optical crystal material MnTeMoO6 and growth method and application thereof

Publication: CN 102839423 B 20150513

Applicant: UNIV CHINA GEOSCIENCES WUHAN
Inventor: JIN CHENGGUO; LI FEI; LI ZHEN
Prio:
Appl.No: CN201210339966
IPC: C30B 29/32

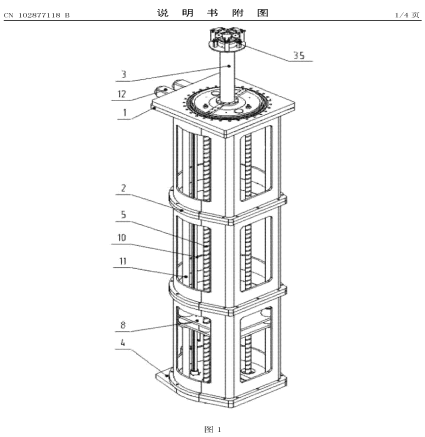


6

Lower shaft moving mechanism for zone melting single-crystal furnace

Publication: CN 102877118 B 20150520

Applicant: ZHEJIANG JINGSHENG MECHANICAL & ELECTRICAL CO LTD
Inventor: CAO JIANWEI; CHEN MINGJIE; FU LINJIAN; OUYANG PENGGEN; QIU MINXIU; SHI GANG; WANG DANTAO
Prio:
Appl.No: CN201210349359
IPC: C30B 13/20

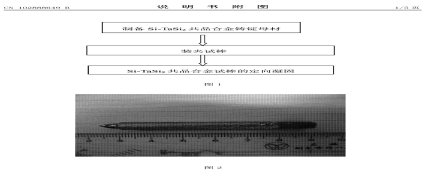


9

Method for preparing Si-TaSi2 eutectic in-situ composite material

Publication: CN 102888649 B 20150527

Applicant: UNIV NORTHWESTERN POLYTECHNIC
Inventor: FU HENGZHI; LIU LIN; SU HAIJUN; YANG XINYU; ZHANG JUN
Prio:
Appl.No: CN201210382748



...

IPC: C30B 11/00

Zone-melting furnace upper shaft with water cooling function

Publication: CN 102912419 B 20150520

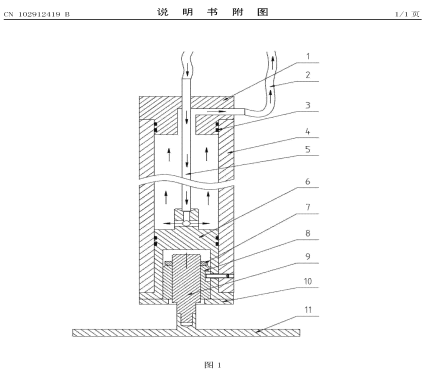
Applicant: ZHEJIANG JINGSHENG MECHANICAL & ELECTRICAL CO LTD

Inventor: CAO JIANWEI; CHEN MINGJIE; FU LINJIAN; OUYANG PENGGEN; QIU MINXIU; SHI GANG; WANG DANTAO

Prio:

Appl.No: CN201210349312

IPC: C30B 13/20



Method for improving uniformity of axial resistivity of czochralski silicon and obtained monocrystalline silicon

Publication: CN 102912424 B 20150513

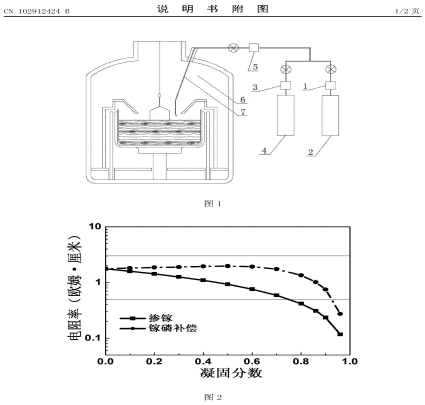
Applicant: UNIV ZHEJIANG

Inventor: CHEN PENG; CHEN XIANZI; WU YICHAO; YANG DEREN; YU XUEGONG

Prio:

Appl.No: CN201210382987

IPC: C30B 15/00



Ba3P3O10Br single crystal and preparation method thereof

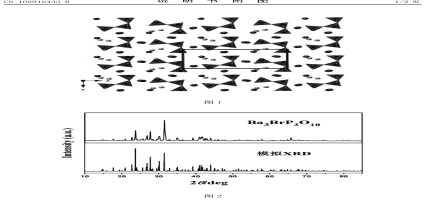
Publication: CN 102912433 B 20150513

Applicant: FUJIAN MATTER STRUCTURE

Inventor: CHEN LING; WU LIMING; WU XINTAO; YU PENG

Prio:

Appl.No: CN201210421506



IPC: C30B 29/10

Method for preparing single domain yttrium barium copper oxide superconduction block by top seed infiltration process

Publication: CN 102925954 B 20150513

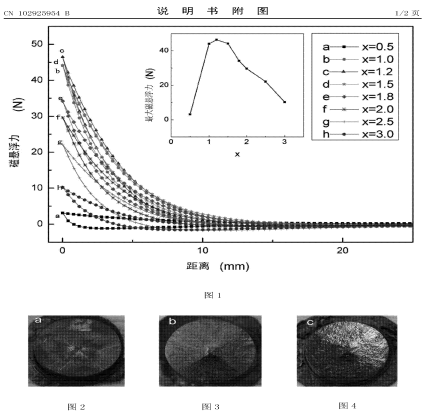
Applicant: UNIV SHAANXI NORMAL

Inventor: WANG MINGZI; WANG XIAOJIANG; YANG WANMIN

Prio:

Appl.No: CN201210507250

IPC: C30B 1/00



12

Operation and observation window for positive-pressure crystal growing furnace

Publication: CN 102925962 B 20150520

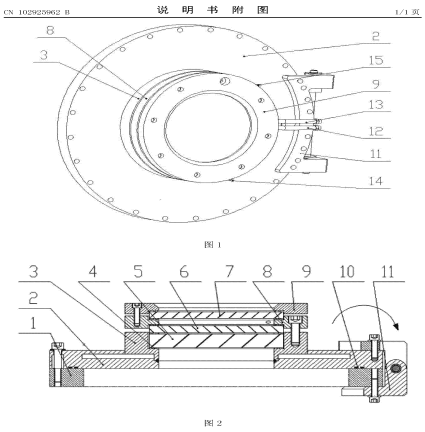
Applicant: ZHEJIANG JINGSHENG MECHANICAL & ELECTRICAL CO LTD

Inventor: CAO JIANWEI; CHEN MINGJIE; FU LINJIAN; JIANG QINGLIANG; OUYANG PENGGEN; QIU MINXIU; SHI GANG; WANG DANTAO

Prio:

Appl.No: CN201210438699

IPC: C30B 13/00



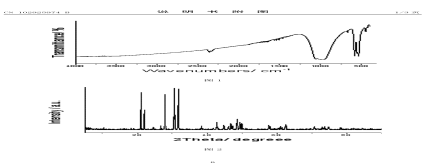
6

Preparation method for high length-diameter ratio lead orthophosphate crystal whisker

Publication: CN 102925974 B 20150527

Applicant: UNIV BOHAI

Inventor: CUI YAN; WANG LILI; XU JIASHENG; ZHANG HE; ZHANG JIE

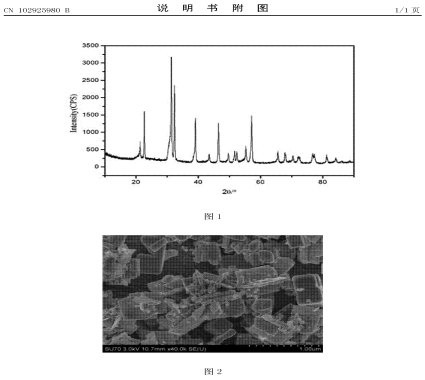


Prio:
Appl.No: CN201210448320
IPC: C30B 29/14

Preparation method of tetragonal perovskite structure lead zirconate ceramic single crystal nanosheet

Publication: CN 102925980 B 20150520

Applicant: UNIV ZHEJIANG
Inventor: HAN GAORONG; HUANG XIAOQIANG; REN ZHAOHUI; SHEN GE; XU GANG
Prio:
Appl.No: CN201210455845
IPC: C30B 29/32

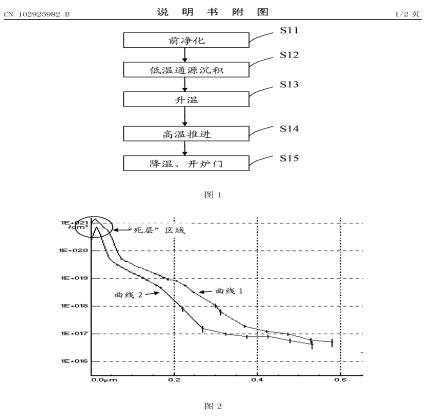


6

Solar cell and diffusion method of solar cell

Publication: CN 102925982 B 20150520

Applicant: YINGLI SOLAR CHINA CO LTD
Inventor: FAN ZHIDONG; LI QIAN; ZHANG XIAOPAN; ZHAO XUELING
Prio:
Appl.No: CN201210461743
IPC: C30B 31/08

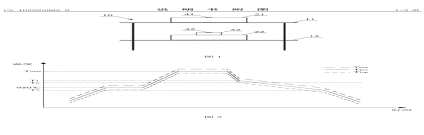


10

Method for batch growth of REBCO high temperature superconducting bulks based on two-layer silicon carbide support

Publication: CN 102925985 B 20150527

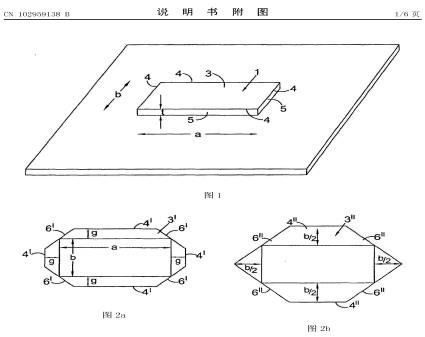
Applicant: UNIV SHANGHAI JIAOTONG



Inventor: CHENG LING; PENG BONAN; XU HENGHENG; YAO XIN; YU DEJING
Prio:
Appl.No: CN201210352797
IPC: C30B 35/00

Single crystal diamond material

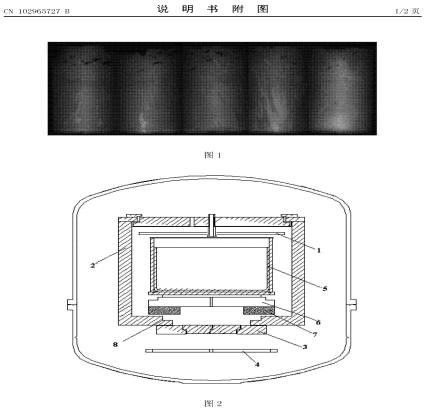
Publication: CN 102959138 B 20150506
Applicant: ELEMENT SIX LTD
Inventor: DHILLON HARPREET KAUR; SCARSBROOK GEOFFREY ALAN; TWITCHEN DANIEL JAMES
Prio: EP 20101215 2010069825, GB 20091221 0922230
Appl.No: CN201080058400
IPC: C30B 25/00



21

Polycrystalline silicon ingot and casting method thereof

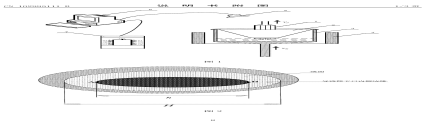
Publication: CN 102965727 B 20150513
Applicant: YINGLI SOLAR CHINA CO LTD
Inventor: HE GUANGCHUAN; PAN JIAMING; WEI JINGTUO
Prio:
Appl.No: CN201210528557
IPC: C30B 28/06



8

Method and device for measuring silicon material liquid level position in single crystal furnace in non-contact manner

Publication: CN 102995111 B 20150527
Applicant: BEIJING SEVEN STAR ELECTRONICS
Inventor: CHEN SHIBIN; TAO ZHIGUI; ZHANG YANLING



Prio:
Appl.No: CN201210441205
IPC: C30B 15/20

Aluminum nitride crystal preparation furnace and thermal-insulation device thereof

Publication: CN 102995116 B 20150520

Applicant: SHANGHAI YUNFENG NEW ENERGY TECHNOLOGY CO LTD
Inventor: SHI HAIBIN; XU YONGLIANG; ZHANG GUOHUA
Prio:
Appl.No: CN201210568237
IPC: C30B 23/00

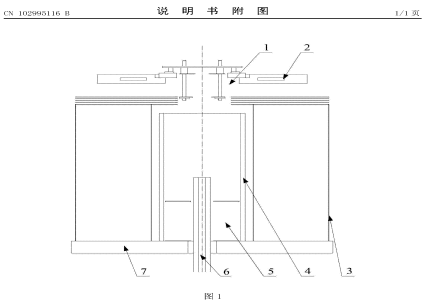


图 1

7

Nanometer TiO2 monocrystalline material, preparation method and application thereof

Publication: CN 102995120 B 20150520

Applicant: NAT CT NANOSCIENCE NCNST CHINA
Inventor: PIAO LINGYU; WU ZHIJIAO; XIE YINGJUAN
Prio:
Appl.No: CN201210537156
IPC: C30B 29/16

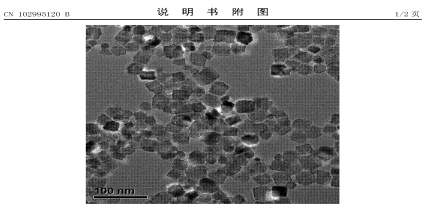


图 1

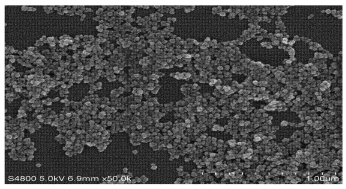
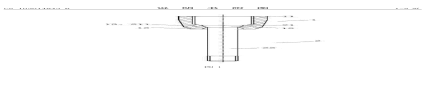


图 2

10

Clamp for mounting seed crystal for growing sapphire crystal with kyropoulos method

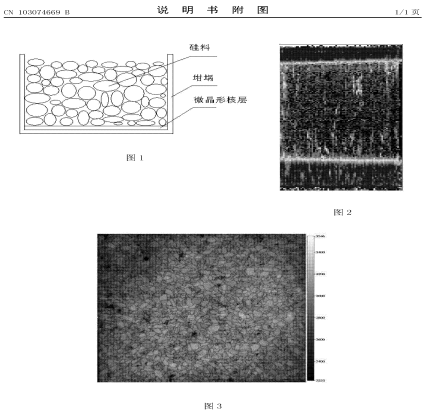
Publication: CN 103014843 B 20150527



Applicant: SUZHOU WE ARE OPTOELECTRONICS TECHNOLOGY CO LTD
Inventor: JU XING; LI QIAN; QIAN BING; WANG HONGWEI; WANG QINGGUO; ZHU YE
Prio:
Appl.No: CN201310008525
IPC: C30B 17/00

Polycrystalline silicon ingot, preparation method thereof and polycrystalline silicon chip

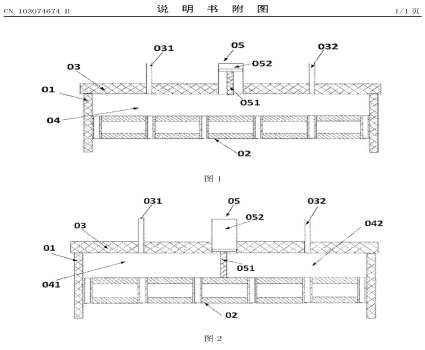
Publication: CN 103074669 B 20150513
Applicant: JIANGXI SAIWEI LDK SOLAR ENERGY HIGH TECH CO LTD
Inventor: CHEN HONGRONG; HU DONGLI; LEI QI; WAN YUEPENG
Prio:
Appl.No: CN201310033073
IPC: C30B 11/00



9

Reaction chamber air inlet device for metal organic chemical vapor deposition (MOCVD) equipment

Publication: CN 103074674 B 20150513
Applicant: INST SEMICONDUCTORS CAS
Inventor: HU GUOXIN; HU QIANG; LI JINMIN; LIANG YONG; RAN JUNXUE; WANG JUNXI; XIONG YANKAI; ZENG YIPING
Prio:
Appl.No: CN201310010357
IPC: C30B 25/14



6

Method for preparing high-purity mullite monocrystal through kyanite concentrate at low temperature

Publication: CN 103074686 B 20150527

Applicant: UNIV HEBEI UNITED
Inventor: BAI LIMEI; GUO AIHONG; NIU FUSHENG; TIAN LINAN
Prio:
Appl.No: CN201310039805
IPC: C30B 29/34

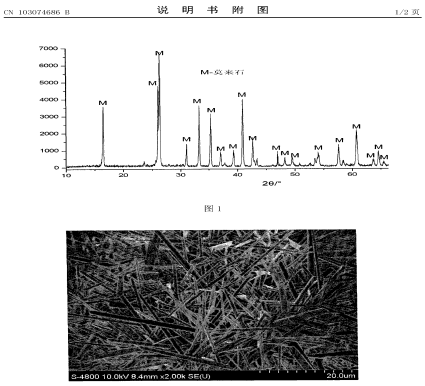


图 1

图 2

Preparation method of molybdenum trioxide nanorod

Publication: CN 103088422 B 20150513

Applicant: UNIV NANJING SCIENCE & TECH
Inventor: DONG YUHUI; DOU KANG; LOU DONG; WANG HAIPENG; ZHANG YICHI; ZOU YOUSHENG
Prio:
Appl.No: CN201310022362
IPC: C30B 29/16

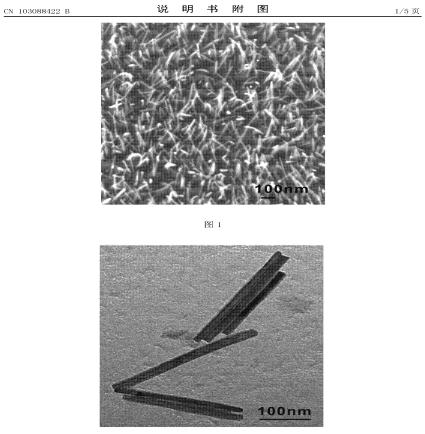


图 1

图 2

Method for eliminating phosphorus oxychloride in phosphorus diffusion furnace

Publication: CN 103088429 B 20150506

Applicant: WU XIAOJIANG
Inventor: CHEN GONG
Prio:
Appl.No: CN201310018278

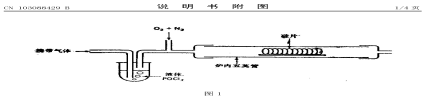


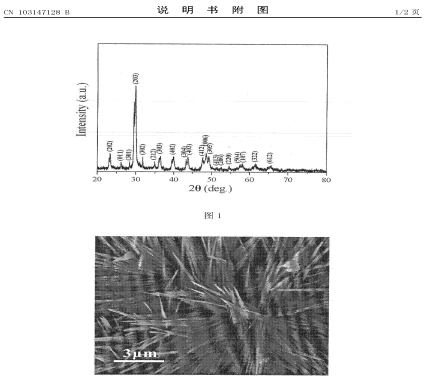
图 1

IPC: C30B 31/16

Manganese vanadate nanoneedle structure and synthesis method thereof

Publication: CN 103147128 B 20150513

Applicant: UNIV ANHUI TECHNOLOGY
Inventor: PEI LIZHAI
Prio:
Appl.No: CN201310074998
IPC: C30B 29/30

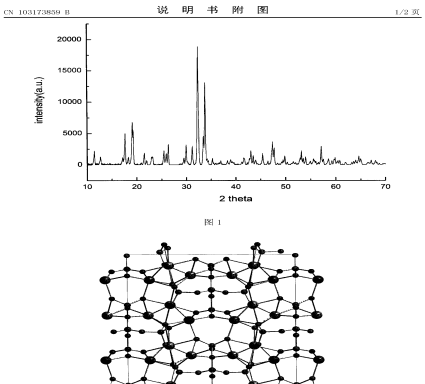


6

Cadmium sodium borophosphate compound, cadmium sodium borophosphate nonlinear optical crystal, preparation methods of compound and crystal, and use of crystal

Publication: CN 103173859 B 20150513

Applicant: XINJIANG TECH INST PHYSICS CAS
Inventor: PAN SHILIE; SHI YUNJING
Prio:
Appl.No: CN201110429720
IPC: C30B 29/22

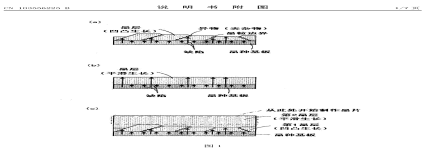


12

Group 13 nitride crystal

Publication: CN 103556225 B 20150527

Applicant: NGK INSULATORS LTD
Inventor: HIRAO TAKAYUKI; IMAI KATSUHIRO; SHIMODAIRA TAKANAO
Prio: JP 20090216 2009032779



Appl.No: CN201310419587
IPC: C30B 29/40