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Patent News nr. 70 (01-2010)



US20090308104A1: Gemstone cut

Applicant: -
Publication: 2009-12-17
Filed: 2009-06-16
Status: application

A novel gemstone cut that has 162 facets such that the crown has 65 separate facets and the pavilion has 97 separate facets.

WO2009154577A1: Method for growing monocrystalline diamonds

Applicant: Nozomi Technotron, Indian Institute of Technology Bombay, India
Publication: 2009-12-23
Filed: 2009-06-18
Status: application

A method of forming mono-crystalline diamond by chemical vapour deposition, the method comprising the steps of: (a) providing at least one diamond seed; (b) exposing the seed to conditions for growing diamond by chemical vapour deposition, including supplying reaction gases that include a carbon-containing gas and hydrogen for growing diamond and include a nitrogen-containing gas; and (c) controlling the quantity of nitrogen-containing gas relative to other gases in the reaction gases such that diamond is caused to grow by step-growth with defect free steps without inclusions. The nitrogen is present in the range of 0.0001 to 0.02 vol %. Diborane can also be present in a range of from 0.00002 to 0.002 vol %. The carbon-containing gas can be methane.

US20090319336A1: Diamond valuation method, apparatus and computer readable medium product

Applicant: Rosy Blue DMCC, Dubai, United Arab Emirates
Publication: 2009-12-24
Filed: 2007-07-30
Status: application

Further it is an object of the present invention to provide a method for evaluating a diamond comprising the steps of selecting a diamond to value, determining the shape, size, color, clarity and cut of the selected diamond, determining a base price of the selected diamond, calculating the applicable discounts/premium for the parameters of the selected diamond, calculating a weightage for each parameter of the selected diamond for which a discount/premium is calculated, calculating a total adjusted price based on the discount/premium determined, the weightage determined and the base price determined in step d, and outputting the calculated total adjusted price. Further it is an object of the present invention to provide a method for determining the discounts/premium applicable to each parameter for a diamond—by selecting records of a given shape, size, color, clarity and cut—where the corresponding parameters are equal or within a specified small range, with the exception of parameter i and then determining the average sales price Y for a diamond for the ideal value V(0) of the selected parameter i, determining an average price Y(i) for a diamond with the selected parameter value of V(i), calculating a discount/premium D(i) of the selected diamond using the formula $D(i)=(Y-Y(i))/Y$, and repeating for each additional parameter V(i) determined. Further, the discount/premium with respect to the base/standard/index diamond, D'(i) is calculated as $D'(i)=[D(i)-D(I)]/[1-D(I)]$ where D(I) is the discount/premium of the base/standard/index diamond. Further it is an object of the present invention to provide a method for determining the weightage for each parameter of the selected diamond by regression analysis for each parameter i.

US20090297429A1: High growth rate methods of producing high-quality diamonds

Applicant: -
Publication: 2009-12-03
Filed: 2006-12-15
Status: application

In one aspect, the invention relates to a method of producing high-quality diamond comprising the steps of providing a mixture comprising hydrogen, a carbon precursor, and oxygen; exposing the mixture to energy at a power sufficient to establish a plasma from the mixture; containing the plasma at a pressure sufficient to maintain the plasma; and depositing carbon-containing species from the plasma to produce diamond at a growth rate of at least about 10 $\mu\text{m/hr}$; wherein the diamond comprises less than about 10 ppm nitrogen. The invention also relates to the apparatus, gas compositions, and plasma compositions used in connection with the methods of the invention as well as the products produced by the methods of the invention. This abstract is intended as a safety scanning tool for purposes of searching in the particular art and is not intended to be limiting of the present invention.

US7628856: Method for producing substrate for single crystal diamond growth

Applicant: Shin-Etsu Chemical, Japan; AGD Material, Japan
Publication: 2009-12-08
Filed: 2007-03-02

Status: granted

There is disclosed a method for producing a substrate for single crystal diamond growth, comprising at least a step of preliminarily subjecting a substrate before single crystal diamond growth to a bias treatment for forming a diamond nucleus thereon by a direct-current discharge in which an electrode in a substrate side is a cathode, and wherein in the treatment, at least, a temperature of the substrate from 40 sec after an initiation of the bias treatment to an end of the bias treatment is held in a range of $800^{\circ}\text{C} \pm 60^{\circ}\text{C}$. There can be provided a method for producing a substrate for single crystal diamond growth, by which a single crystal diamond can be grown more certainly.

US7622151: Method of plasma enhanced chemical vapor deposition of diamond using methanol-based solutions

Applicant: Auburn University, United States of America
Publication: 2009-11-24
Filed: 2004-02-05
Status: granted

Briefly described, methods of forming diamond are described. A representative method, among others, includes: providing a substrate in a reaction chamber in a non-magnetic-field microwave plasma system; introducing, in the absence of a gas stream, a liquid precursor substantially free of water and containing methanol and at least one carbon and oxygen containing compound having a carbon to oxygen ratio greater than one, into an inlet of the reaction chamber; vaporizing the liquid precursor; and subjecting the vaporized precursor, in the absence of a carrier gas and in the absence in a reactive gas, to a plasma under conditions effective to disassociate the vaporized precursor and promote diamond growth on the substrate in a pressure range from about 70 to 130 Torr.

EP1444390B1: Apparatus and method for diamond production

Applicant: Carnegie Institution of Washington; The UAB Research Foundation, United States of America
Publication: 2009-12-30
Filed: 2002-11-07
Status: granted

An apparatus for producing diamond in a deposition chamber, comprising: (i) a heat-sinking holder for holding a diamond and for making thermal contact with a side surface of the diamond adjacent to an edge of a growth surface of the diamond; (ii) a thermal mass for receiving thermal energy from the heat-sinking holder, wherein the diamond is retained in said heat-sinking holder by pressure applied through the thermal mass; (iii) a stage for receiving thermal energy from the heat-sinking holder via the thermal mass; (iv) means for regulating the heat transfer between said diamond, thermal mass and stage and, optionally, other parameters, such as height between diamond growth surface and heat-sinking holder, plasma power, coolant flow rate and temperature, or gas flow rate;

(v) either (a) a noncontact temperature measurement device positioned to monitor the temperature gradient between a single edge or corner point with respect to the middle of the growth surface, indicative of the maximum temperature gradient that exists across the growth surface of the diamond; or (b) a plurality of non-contact temperature measurement devices positioned to monitor the temperature at a plurality of locations on the diamond's surface; and (vi) a main process controller programmed to determine, in the case of (v)(a) the maximum temperature gradient that exists across the growth surface of the diamond or, in the case of (v)(b) programmed to integrate overlapping fields of view from multiple pyrometers to produce a contiguous "map" of the temperatures across the diamond's growth surface; and further programmed to control the temperature of the growth surface such that all temperature gradients across the growth surface are less than 20°C.

EP1890799B1: Method for growing synthetic diamonds

Applicant: MMI Trust Holding, Luxembourg
Publication: 2009-11-25
Filed: 2006-05-30
Status: granted

Growth of synthetic diamonds used as gemstones comprises subjecting carbonaceous material comprising polycrystalline nanodiamond particles to high-pressure and high-temperature treatment

WO2009114130A3: Process and apparatus for diamond synthesis

Applicant: Michigan State University United States of America; Fraunhofer USA
Publication: 2009-12-30
Filed: 2009-03-10
Status: later publication of ISR with revised front page

The present invention relates to a microwave plasma deposition process and apparatus for producing diamond, preferably as single crystal diamond (SCD). The process and apparatus enables the production of multiple layers of the diamond by the use of an extending device to increase the length and the volume of a recess in a holder containing a SCD substrate as layers of diamond are deposited. The diamond is used for abrasives, cutting tools, gems, electronic substrates, heat sinks, electrochemical electrodes, windows for high power radiation and electron beams, and detectors.

ES2273815T5: Cambio de color de un diamante mediante alta temperatura/alta presion.

Applicant: Element Six Technologies
Publication: 2009-12-07
Filed: 2001-04-02
Status: translation of modified European patent

Changing the color of brown type IIa diamond from brown to pink involves creating reaction mass by providing diamond in pressure transmitting medium, and subjecting the reaction mass to specified temperature and pressure

ES2273824T5: Cambio de color de un diamante mediante alta temperatura/alta presión.

Applicant: Element Six Technologies
Publication: 2009-12-02
Filed: 2001-04-02
Status: translation of modified European patent

Changing of grey type IIb diamond from grey to blue or enhancing the color of type IIb diamond by creating reaction mass, and subjecting the reaction mass to specified temperature and pressure

EP2125188A2: Large single crystal diamonds

Applicant: Element Six Technologies
Publication: 2009-12-02
Filed: 2008-03-07
Status: application

Single crystal diamond synthesis used, e.g. as cutting tool, by mounting single crystal diamond seed on substrate, and effecting crystal growth in high pressure high temperature environment
