Symbol	Typ	Titel
C	**Sektion**	**CHEMISTRY; METALLURGY**
C30	**Klasse**	**CRYSTAL GROWTH [3]**
C30B	**Unterklasse**	**SINGLE-CRYSTAL GROWTH (by using ultra-high pressure, e.g. for the formation of diamonds B01J 3/06); UNIDIRECTIONAL SOLIDIFICATION OF EUTECTIC MATERIAL OR UNIDIRECTIONAL DEMIXING OF EUTECTOID MATERIAL; REFINING BY ZONE-MELTING OF MATERIAL (zone-refining of metals or alloys C22B); PRODUCTION OF A HOMOGENEOUS POLYCRYSTALLINE MATERIAL WITH DEFINED STRUCTURE (casting of metals, casting of other substances by the same processes or devices B22D; working of plastics B29; modifying the physical structure of metals or alloys C21D, C22F); SINGLE CRYSTALS OR HOMOGENEOUS POLYCRYSTALLINE MATERIAL WITH DEFINED STRUCTURE; AFTER-TREATMENT OF SINGLE CRYSTALS OR A HOMOGENEOUS POLYCRYSTALLINE MATERIAL WITH DEFINED STRUCTURE (for producing semiconductor devices or parts thereof H01L); APPARATUS THEREFOR [3]**
		Single-crystal growth from solids or gels [3]
C30B 1/00	**Hauptgruppe**	**Single-crystal growth directly from the solid state (unidirectional demixing of eutectoid materials C30B 3/00; under a protective fluid C30B 27/00) [3, 2006.01]**
C30B 1/02	1-Punkt Untergruppe	. by thermal treatment, e.g. strain annealing (C30B 1/12 takes precedence) [3, 2006.01]
C30B 1/04	2-Punkt Untergruppe	. . Isothermal recrystallisation [3, 2006.01]
C30B 1/06	2-Punkt Untergruppe	. . Recrystallisation under a temperature gradient [3, 2006.01]
C30B 1/08	3-Punkt Untergruppe	. . . Zone recrystallisation [3, 2006.01]
C30B 1/10	1-Punkt Untergruppe	. by solid state reactions or multi-phase diffusion [3, 2006.01]
C30B 1/12	1-Punkt Untergruppe	. by pressure treatment during the growth [3, 2006.01]
C30B 3/00	**Hauptgruppe**	**Unidirectional demixing of eutectoid materials [3, 2006.01]**
C30B 5/00	**Hauptgruppe**	**Single-crystal growth from gels (under a protective fluid C30B 27/00) [3, 2006.01]**
C30B 5/02	1-Punkt Untergruppe	. with addition of doping materials [3, 2006.01]
		Single-crystal growth from liquids; Unidirectional solidification of eutectic materials [3]
C30B 7/00	**Hauptgruppe**	**Single-crystal growth from solutions using solvents which are liquid at normal temperature, e.g. aqueous solutions (from molten solvents C30B 9/00; by normal or gradient freezing C30B 11/00; under a protective fluid C30B 27/00) [3, 2006.01]**
C30B 7/02	1-Punkt Untergruppe	. by evaporation of the solvent [3, 2006.01]
C30B 7/04	2-Punkt Untergruppe	. . using aqueous solvents [3, 2006.01]
C30B 7/06	2-Punkt Untergruppe	. . using non-aqueous solvents [3, 2006.01]
C30B 7/08	1-Punkt Untergruppe	. by cooling of the solution [3, 2006.01]
C30B 7/10	1-Punkt Untergruppe	. by application of pressure, e.g. hydrothermal processes [3, 2006.01]
C30B 7/12	1-Punkt Untergruppe	. by electrolysis [3, 2006.01]
C30B 7/14	1-Punkt Untergruppe	. the crystallising materials being formed by chemical reactions in the solution [3, 2006.01]
C30B 9/00	**Hauptgruppe**	**Single-crystal growth from melt solutions using molten solvents (by normal or gradient freezing C30B 11/00; by zone-melting C30B 13/00; by crystal pulling C30B 15/00; on immersed seed crystal C30B 17/00; by liquid phase epitaxial growth C30B 19/00; under a protective fluid C30B 27/00) [3, 2006.01]**
C30B 9/02	1-Punkt Untergruppe	. by evaporation of the molten solvent [3, 2006.01]
C30B 9/04	1-Punkt Untergruppe	. by cooling of the solution [3, 2006.01]

Symbol	Typ	Titel
C30B 9/06	2-Punkt Untergruppe	. . using as solvent a component of the crystal composition [3, 2006.01]
C30B 9/08	2-Punkt Untergruppe	. . using other solvents [3, 2006.01]
C30B 9/10	3-Punkt Untergruppe	. . . Metal solvents [3, 2006.01]
C30B 9/12	3-Punkt Untergruppe	. . . Salt solvents, e.g. flux growth [3, 2006.01]
C30B 9/14	1-Punkt Untergruppe	. by electrolysis [3, 2006.01]
C30B 11/00	**Hauptgruppe**	**Single-crystal-growth by normal freezing or freezing under temperature gradient, e.g. Bridgman-Stockbarger method (C30B 13/00, C30B 15/00, C30B 17/00, C30B 19/00 take precedence; under a protective fluid C30B 27/00) [3, 2006.01]**
C30B 11/02	1-Punkt Untergruppe	. without using solvents (C30B 11/06 takes precedence) [3, 2006.01]
C30B 11/04	1-Punkt Untergruppe	. adding crystallising materials or reactants forming it in situ to the melt [3, 2006.01]
C30B 11/06	2-Punkt Untergruppe	. . at least one but not all components of the crystal composition being added [3, 2006.01]
C30B 11/08	2-Punkt Untergruppe	. . every component of the crystal composition being added during the crystallisation [3, 2006.01]
C30B 11/10	3-Punkt Untergruppe	. . . Solid or liquid components, e.g. Verneuil method [3, 2006.01]
C30B 11/12	3-Punkt Untergruppe	. . . Vaporous components, e.g. vapour-liquid-solid-growth [3, 2006.01]
C30B 11/14	1-Punkt Untergruppe	. characterised by the seed, e.g. its crystallographic orientation [3, 2006.01]
C30B 13/00	**Hauptgruppe**	**Single-crystal growth by zone-melting; Refining by zone-melting (C30B 17/00 takes precedence; by changing the cross-section of the treated solid C30B 15/00; under a protective fluid C30B 27/00 ; for the growth of homogeneous polycrystalline material with defined structure C30B 28/00; zone-refining of specific materials, see the relevant subclasses for the materials) [3, 5, 2006.01]**
C30B 13/02	1-Punkt Untergruppe	. Zone-melting with a solvent, e.g. travelling solvent process [3, 2006.01]
C30B 13/04	1-Punkt Untergruppe	. Homogenisation by zone-levelling [3, 2006.01]
C30B 13/06	1-Punkt Untergruppe	. the molten zone not extending over the whole cross-section [3, 2006.01]
C30B 13/08	1-Punkt Untergruppe	. adding crystallising materials or reactants forming it in situ to the molten zone [3, 2006.01]
C30B 13/10	2-Punkt Untergruppe	. . with addition of doping materials [3, 2006.01]
C30B 13/12	3-Punkt Untergruppe	. . . in the gaseous or vapour state [3, 2006.01]
C30B 13/14	1-Punkt Untergruppe	. Crucibles or vessels [3, 2006.01]
C30B 13/16	1-Punkt Untergruppe	. Heating of the molten zone [3, 2006.01]
C30B 13/18	2-Punkt Untergruppe	. . the heating element being in contact with, or immersed in, the molten zone [3, 2006.01]
C30B 13/20	2-Punkt Untergruppe	. . by induction, e.g. hot wire technique (C30B 13/18 takes precedence) [3, 2006.01]
C30B 13/22	2-Punkt Untergruppe	. . by irradiation or electric discharge [3, 2006.01]
C30B 13/24	3-Punkt Untergruppe	. . . using electromagnetic waves [3, 2006.01]
C30B 13/26	1-Punkt Untergruppe	. Stirring of the molten zone [3, 2006.01]
C30B 13/28	1-Punkt Untergruppe	. Controlling or regulating [3, 2006.01]
C30B 13/30	2-Punkt Untergruppe	. . Stabilisation or shape controlling of the molten zone, e.g. by concentrators, by electromagnetic fields; Controlling the section of the crystal [3, 2006.01]

Symbol	Typ	Titel
C30B 13/32	1-Punkt Untergruppe	. Mechanisms for moving either the charge or the heater [3, 2006.01]
C30B 13/34	1-Punkt Untergruppe	. characterised by the seed, e.g. by its crystallographic orientation [3, 2006.01]
C30B 15/00	**Hauptgruppe**	**Single-crystal growth by pulling from a melt, e.g. Czochralski method (under a protective fluid C30B 27/00) [3, 2006.01]**
C30B 15/02	1-Punkt Untergruppe	. adding crystallising materials or reactants forming it in situ to the melt [3, 2006.01]
C30B 15/04	2-Punkt Untergruppe	. . adding doping materials, e.g. for n–p-junction [3, 2006.01]
C30B 15/06	1-Punkt Untergruppe	. Non-vertical pulling [3, 2006.01]
C30B 15/08	1-Punkt Untergruppe	. Downward pulling [3, 2006.01]
C30B 15/10	1-Punkt Untergruppe	. Crucibles or containers for supporting the melt [3, 2006.01]
C30B 15/12	2-Punkt Untergruppe	. . Double crucible methods [3, 2006.01]
C30B 15/14	1-Punkt Untergruppe	. Heating of the melt or the crystallised materials [3, 2006.01]
C30B 15/16	2-Punkt Untergruppe	. . by irradiation or electric discharge [3, 2006.01]
C30B 15/18	2-Punkt Untergruppe	. . using direct resistance heating in addition to other methods of heating, e.g. using Peltier heat [3, 2006.01]
C30B 15/20	1-Punkt Untergruppe	. Controlling or regulating (controlling or regulating in general G05) [3, 2006.01]
C30B 15/22	2-Punkt Untergruppe	. . Stabilisation or shape controlling of the molten zone near the pulled crystal; Controlling the section of the crystal [3, 2006.01]
C30B 15/24	3-Punkt Untergruppe	. . . using mechanical means, e.g. shaping guides (shaping dies for edge-defined film-fed crystal growth C30B 15/34) [3, 2006.01]
C30B 15/26	3-Punkt Untergruppe	. . . using television detectors; using photo or X-ray detectors [3, 2006.01]
C30B 15/28	3-Punkt Untergruppe	. . . using weight changes of the crystal or the melt, e.g. flotation methods [3, 2006.01]
C30B 15/30	1-Punkt Untergruppe	. Mechanisms for rotating or moving either the melt or the crystal (flotation methods C30B 15/28) [3, 2006.01]
C30B 15/32	1-Punkt Untergruppe	. Seed holders, e.g. chucks [3, 2006.01]
C30B 15/34	1-Punkt Untergruppe	. Edge-defined film-fed crystal growth using dies or slits [3, 2006.01]
C30B 15/36	1-Punkt Untergruppe	. characterised by the seed, e.g. its crystallographic orientation [3, 2006.01]
C30B 17/00	**Hauptgruppe**	**Single-crystal growth on to a seed which remains in the melt during growth, e.g. Nacken-Kyropoulos method (C30B 15/00 takes precedence) [3, 2006.01]**
C30B 19/00	**Hauptgruppe**	**Liquid-phase epitaxial-layer growth [3, 2006.01]**
C30B 19/02	1-Punkt Untergruppe	. using molten solvents, e.g. flux [3, 2006.01]
C30B 19/04	2-Punkt Untergruppe	. . the solvent being a component of the crystal composition [3, 2006.01]
C30B 19/06	1-Punkt Untergruppe	. Reaction chambers; Boats for supporting the melt; Substrate holders [3, 2006.01]
C30B 19/08	1-Punkt Untergruppe	. Heating of the reaction chamber or the substrate [3, 2006.01]
C30B 19/10	1-Punkt Untergruppe	. Controlling or regulating (controlling or regulating in general G05) [3, 2006.01]
C30B 19/12	1-Punkt Untergruppe	. characterised by the substrate [3, 2006.01]
C30B 21/00	**Hauptgruppe**	**Unidirectional solidification of eutectic materials [3, 2006.01]**

Symbol	Typ	Titel
C30B 21/02	1-Punkt Untergruppe	. by normal casting or gradient freezing [3, 2006.01]
C30B 21/04	1-Punkt Untergruppe	. by zone-melting [3, 2006.01]
C30B 21/06	1-Punkt Untergruppe	. by pulling from a melt [3, 2006.01]
		Single-crystal growth from vapours [3]
C30B 23/00	**Hauptgruppe**	**Single-crystal growth by condensing evaporated or sublimed materials [3, 2006.01]**
C30B 23/02	1-Punkt Untergruppe	. Epitaxial-layer growth [3, 2006.01]
C30B 23/04	2-Punkt Untergruppe	. . Pattern deposit, e.g. by using masks [3, 2006.01]
C30B 23/06	2-Punkt Untergruppe	. . Heating of the deposition chamber, the substrate, or the materials to be evaporated [3, 2006.01]
C30B 23/08	2-Punkt Untergruppe	. . by condensing ionised vapours (by reactive sputtering C30B 25/06) [3, 2006.01]
C30B 25/00	**Hauptgruppe**	**Single-crystal growth by chemical reaction of reactive gases, e.g. chemical vapour deposition growth [3, 2006.01]**
C30B 25/02	1-Punkt Untergruppe	. Epitaxial-layer growth [3, 2006.01]
C30B 25/04	2-Punkt Untergruppe	. . Pattern deposit, e.g. by using masks [3, 2006.01]
C30B 25/06	2-Punkt Untergruppe	. . by reactive sputtering [3, 2006.01]
C30B 25/08	2-Punkt Untergruppe	. . Reaction chambers; Selection of materials therefor [3, 2006.01]
C30B 25/10	2-Punkt Untergruppe	. . Heating of the reaction chamber or the substrate [3, 2006.01]
C30B 25/12	2-Punkt Untergruppe	. . Substrate holders or susceptors [3, 2006.01]
C30B 25/14	2-Punkt Untergruppe	. . Feed and outlet means for the gases; Modifying the flow of the reactive gases [3, 2006.01]
C30B 25/16	2-Punkt Untergruppe	. . Controlling or regulating (controlling or regulating in general G05) [3, 2006.01]
C30B 25/18	2-Punkt Untergruppe	. . characterised by the substrate [3, 2006.01]
C30B 25/20	3-Punkt Untergruppe	. . . the substrate being of the same materials as the epitaxial layer [3, 2006.01]
C30B 25/22	2-Punkt Untergruppe	. . Sandwich processes [3, 2006.01]
C30B 27/00	**Hauptgruppe**	**Single-crystal growth under a protective fluid [3, 2006.01]**
C30B 27/02	1-Punkt Untergruppe	. by pulling from a melt [3, 2006.01]
C30B 28/00	**Hauptgruppe**	**Production of homogeneous polycrystalline material with defined structure [5, 2006.01]**
C30B 28/02	1-Punkt Untergruppe	. directly from the solid state [5, 2006.01]
C30B 28/04	1-Punkt Untergruppe	. from liquids [5, 2006.01]
C30B 28/06	2-Punkt Untergruppe	. . by normal freezing or freezing under temperature gradient [5, 2006.01]
C30B 28/08	2-Punkt Untergruppe	. . by zone-melting [5, 2006.01]
C30B 28/10	2-Punkt Untergruppe	. . by pulling from a melt [5, 2006.01]
C30B 28/12	1-Punkt Untergruppe	. directly from the gas state [5, 2006.01]
C30B 28/14	2-Punkt Untergruppe	. . by chemical reaction of reactive gases [5, 2006.01]
C30B 29/00	**Hauptgruppe**	**Single crystals or homogeneous polycrystalline material with defined structure characterised by the material or by their shape [3, 5, 2006.01]**
C30B 29/02	1-Punkt Untergruppe	. Elements [3, 2006.01]

Symbol	Typ	Titel
C30B 29/04	2-Punkt Untergruppe	. . Diamond [3, 2006.01]
C30B 29/06	2-Punkt Untergruppe	. . Silicon [3, 2006.01]
C30B 29/08	2-Punkt Untergruppe	. . Germanium [3, 2006.01]
C30B 29/10	1-Punkt Untergruppe	. Inorganic compounds or compositions [3, 2006.01]
C30B 29/12	2-Punkt Untergruppe	. . Halides [3, 2006.01]
C30B 29/14	2-Punkt Untergruppe	. . Phosphates [3, 2006.01]
C30B 29/16	2-Punkt Untergruppe	. . Oxides [3, 2006.01]
C30B 29/18	3-Punkt Untergruppe	. . . Quartz [3, 2006.01]
C30B 29/20	3-Punkt Untergruppe	. . . Aluminium oxides [3, 2006.01]
C30B 29/22	3-Punkt Untergruppe	. . . Complex oxides [3, 2006.01]
C30B 29/24	4-Punkt Untergruppe	. . . . with formula $AMeO_3$, wherein A is a rare earth metal and Me is Fe, Ga, Sc, Cr, Co, or Al, e.g. ortho ferrites [3, 2006.01]
C30B 29/26	4-Punkt Untergruppe	. . . . with formula BMe_2O_4, wherein B is Mg, Ni, Co, Al, Zn or Cd and Me is Fe, Ga, Sc, Cr, Co, or Al [3, 2006.01]
C30B 29/28	4-Punkt Untergruppe	. . . . with formula $A_3Me_5O_{12}$, wherein A is a rare earth metal and Me is Fe, Ga, Sc, Cr, Co or Al, e.g. garnets [3, 2006.01]
C30B 29/30	4-Punkt Untergruppe	. . . . Niobates; Vanadates; Tantalates [3, 2006.01]
C30B 29/32	4-Punkt Untergruppe	. . . . Titanates; Germanates; Molybdates; Tungstates [3, 2006.01]
C30B 29/34	2-Punkt Untergruppe	. . Silicates [3, 2006.01]
C30B 29/36	2-Punkt Untergruppe	. . Carbides [3, 2006.01]
C30B 29/38	2-Punkt Untergruppe	. . Nitrides [3, 2006.01]
C30B 29/40	2-Punkt Untergruppe	. . $A_{III}B_V$ compounds [3, 2006.01]
C30B 29/42	3-Punkt Untergruppe	. . . Gallium arsenide [3, 2006.01]
C30B 29/44	3-Punkt Untergruppe	. . . Gallium phosphide [3, 2006.01]
C30B 29/46	2-Punkt Untergruppe	. . Sulfur-, selenium- or tellurium-containing compounds [3, 2006.01]
C30B 29/48	3-Punkt Untergruppe	. . . $A_{II}B_{VI}$ compounds [3, 2006.01]
C30B 29/50	4-Punkt Untergruppe	. . . . Cadmium sulfide [3, 2006.01]
C30B 29/52	2-Punkt Untergruppe	. . Alloys [3, 2006.01]
C30B 29/54	1-Punkt Untergruppe	. Organic compounds [3, 2006.01]
C30B 29/56	2-Punkt Untergruppe	. . Tartrates [3, 2006.01]
C30B 29/58	2-Punkt Untergruppe	. . Macromolecular compounds [3, 2006.01]
C30B 29/60	1-Punkt Untergruppe	. characterised by shape [3, 2006.01]
C30B 29/62	2-Punkt Untergruppe	. . Whiskers or needles [3, 2006.01]

Symbol	Typ	Titel
C30B 29/64	2-Punkt Untergruppe	. . Flat crystals, e.g. plates, strips or discs [5, 2006.01]
C30B 29/66	2-Punkt Untergruppe	. . Crystals of complex geometrical shape, e.g. tubes, cylinders [5, 2006.01]
C30B 29/68	2-Punkt Untergruppe	. . Crystals with laminate structure, e.g. "superlattices" [5, 2006.01]
C30B 30/00	**Hauptgruppe**	**Production of single crystals or homogeneous polycrystalline material with defined structure characterised by the action of electric or magnetic fields, wave energy or other specific physical conditions [5, 2006.01]**
C30B 30/02	1-Punkt Untergruppe	. using electric fields, e.g. electrolysis [5, 2006.01]
C30B 30/04	1-Punkt Untergruppe	. using magnetic fields [5, 2006.01]
C30B 30/06	1-Punkt Untergruppe	. using mechanical vibrations [5, 2006.01]
C30B 30/08	1-Punkt Untergruppe	. in conditions of zero-gravity or low gravity [5, 2006.01]
		After-treatment of single crystals or homogeneous polycrystalline material with defined structure [3, 5]
C30B 31/00	**Hauptgruppe**	**Diffusion or doping processes for single crystals or homogeneous polycrystalline material with defined structure; Apparatus therefor [3, 5, 2006.01]**
C30B 31/02	1-Punkt Untergruppe	. by contacting with diffusion materials in the solid state [3, 2006.01]
C30B 31/04	1-Punkt Untergruppe	. by contacting with diffusion materials in the liquid state [3, 2006.01]
C30B 31/06	1-Punkt Untergruppe	. by contacting with diffusion material in the gaseous state (C30B 31/18 takes precedence) [3, 2006.01]
C30B 31/08	2-Punkt Untergruppe	. . the diffusion materials being a compound of the elements to be diffused [3, 2006.01]
C30B 31/10	2-Punkt Untergruppe	. . Reaction chambers; Selection of materials therefor [3, 2006.01]
C30B 31/12	2-Punkt Untergruppe	. . Heating of the reaction chamber [3, 2006.01]
C30B 31/14	2-Punkt Untergruppe	. . Substrate holders or susceptors [3, 2006.01]
C30B 31/16	2-Punkt Untergruppe	. . Feed and outlet means for the gases; Modifying the flow of the gases [3, 2006.01]
C30B 31/18	2-Punkt Untergruppe	. . Controlling or regulating [3, 2006.01]
C30B 31/20	1-Punkt Untergruppe	. Doping by irradiation with electromagnetic waves or by particle radiation [3, 2006.01]
C30B 31/22	2-Punkt Untergruppe	. . by ion-implantation [3, 2006.01]
C30B 33/00	**Hauptgruppe**	**After-treatment of single crystals or homogeneous polycrystalline material with defined structure (C30B 31/00 takes precedence) [3, 5, 2006.01]**
C30B 33/02	1-Punkt Untergruppe	. Heat treatment (C30B 33/04, C30B 33/06 take precedence) [5, 2006.01]
C30B 33/04	1-Punkt Untergruppe	. using electric or magnetic fields or particle radiation [5, 2006.01]
C30B 33/06	1-Punkt Untergruppe	. Joining of crystals [5, 2006.01]
C30B 33/08	1-Punkt Untergruppe	. Etching [5, 2006.01]
C30B 33/10	2-Punkt Untergruppe	. . in solutions or melts [5, 2006.01]
C30B 33/12	2-Punkt Untergruppe	. . in gas atmosphere or plasma [5, 2006.01]
C30B 35/00	**Hauptgruppe**	**Apparatus not otherwise provided for, specially adapted for the growth, production or after-treatment of single crystals or of a homogeneous polycrystalline material with defined structure [3, 5, 2006.01]**