ISSRNS'96/3rd INTERNATIONAL SCHOOL AND SYMPOSIUM ON SYNCHROTRON RADIATION IN NATURAL SCIENCE Jaszowiec, Poland, 31/05-08/06.1996

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X-RAY DIFFRACTION, TEM AND IR STUDY OF GRADUALLY NUCLEATING Cz Si ANNEALED AT HIGH TEMPERATURES

Czochralski grown silicon single crystals of different oxygen content [1,2] and *n* or *p* type and were investigated by X-ray Lang and section topography as well as transmission electron microscopy and IR spectroscopy. The crystals were annealed in two different processes: either isothermally during 4 hours at 750°C followed by 1 hour of annealing at 1050°C and 4 hours at 1150°C, or with gradually increased temperature (by 1°C/minute), starting from 750°C up to 1050°C and then isothermally for 4 hours at 1150°C. The X-ray topographic studies were performed using $MoK_{\alpha 1}$ radiation and symmetric reflections (440, 660 for [001] oriented samples and 440, 660, 224 and 448 reflections for [111] oriented samples) as well as asymmetric ones (333, 335 for [001] samples and 333, 335 0,04 and 117 for [111] samples).

The aim of these studies was to investigate the defects formed during the annealing processes. Lang and section topography revealed diffraction contrasts of the order of 1-100 μm for spherical defects while TEM covered microdefects of sizes in the range between 0.1 μm and several micrometers.

Different density of precipitates in the samples annealed in both types of processes was observed in Lang topographs. Big differences in the visibility of the Kato fringes in section topographs taken with asymmetric and symmetric reflections seem to indicate the presence of very small statistically distributed microdefects in these crystals. The interference fringes are well recognizable even on asymmetrical section topographs for samples containing smallest density of incorporated oxygen. By means of TEM various kinds of defects were observed [3]; for instance, spherical precipitates and their agglomerations, dislocation loops and dipoles with different dimensions (in the range of 0.1-1μm) and densities.

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Materiał prezentowano na sesji posterów.
Tekst wydrukowano w materiałach z konferencji.

ICAM'96/5th INTERNATIONAL CONGRESS ON APPLIED MINERALOGY
Warszawa, Poland, 02-05/06.1996

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JAN CZOCHRALSKI - METHOD OF THE CRYSTALS PULLING - TODAY STATUS

One of the most rapidly developing domain today is technology of single crystals growth. It is quite clear because develop of electronic would not be possible without suitable materials specially without crystals. One of the method widely used in practice to produce crystals in large scale is Czochralski method. It can be said that about 50% of all crystals actually produced in the world are manufactured by Czochralski. For example most popular silicon crystals are fabricated in boule form 6 inches in diameter and 1.5-2 m in lenght.

Idea of Czochralski method is very simply however phenominas observed while growth make it complicated. Heat and mass transwer apeearing in crucible, thermal conditions near interface and in region above the melt strongly influence on quality of product. Production of crystals in large scale is in high level automated apparatus what makes that method is really commonly used, and obtained crystals possess high structural perfection.

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BIADS'96/ EUROCONFERENCE + 4th INTERNATIONAL WORKSHOP ON BEAM INJECTION ASSESSMENT OF DEFECTS IN SEMICONDUCTORS
El Escorial, Spain, 03-06/06.1996

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INVESTIGATION OF DEEP-LEVEL DEFECTS IN SEMI-INSULATING GaAs AND InP BY ANALYSIS OF PHOTO-INDUCED CURRENT TRANSIENTS

Semi-insulating (SI) GaAs and InP wafers are used as substrate materials for devices which can operate in the teraherz frequency range. Characterisation of deep-level defects in these materials involves filling the traps with the charge carriers generated by an optical beam and measurement of the current transient when the light is off. The photocurrent decay is then analysed in order to evaluate the thermal emission rate, the temperture dependence of which enables the trap activation energy and capture cross-section to be determined. In this contribution we demonstrate a digital method of the photocurrent decay measurement which results in a better resolution of deep traps. The measured signal is digitised nad then directly fitted by an iterative least squares method using a multi-exponential model. The measurements for SI undoped GaAs, performed in the temperature range of 300-350 K, enabled us to resolve three traps: T1 (0.58 eV), T2 (0.66 eV) and T3 (0.73 eV) ascribed to the known centres EL3, HL9 and EL2, respectively. In the case of SI Fe-doped InP, the measurements in the same temperature range revealed the negative photocurrent

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transient attributed to the electron emission from the acceptor centres Fe^{2+} whose activation energy was found to be 0.64 eV. From the measurements in the range of 150-160 K, two traps with activation energies of 0.12 eV and 0.23 eV were resolved.

Materiał prezentowano na sesji posterów.
Tekst wydrukowano w Materials Science and Engineering B 1996 r.

E-MRS 1996 SPRING MEETING
Strasbourg, France, 04-07/06.1996

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CHARACTERIZATION OF POROUS SILICON BY RAMAN SCATTERING AND PHOTOLUMINESCENCE

The structural and light-emitting properties of porous Si prepared from the lightly and heavily doped p-type Si (111) have been studied by Raman scattering and photoluminescence. A detailed analysis of the Raman band shapes was performed using models of a two and three dimensional confinements and realisitic LO and TO phonon dispersion curves. Prevailing nanocrystallite types and characteristic sizes of Si spheres of wires were determined for different samples series of porosities from 30 to 80%. Typically, two or three peaks are present in a size distribution, in the range from about 2 to 10 nm. High porosity samples consist of fine Si spheres, while those of a lower porosity are mostly wire-like. A presence of strain was confirmed in some samples. No splitting of LO and TO phonons due to the relaxation of momentum conservation was observed.

Photoluminescence (PL) spectra are less size-sensitive than the Raman ones and no clear correlation between a blue shift in PL and a red shift in the Raman scattering has been observed. It appears that mostly small sized crystallites contribute

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to the efficient PL. It is not possible to explain PL bands by the phonon confinement model only and some other, mostly surface effects are discussed.

Materiał prezentowano na sesji posterów.
Tekst wydrukowano w materiałach z konferencji.

PM'96/THE EUROPEAN CONFERENCE PHYSICS OF MAGNETISM 1996
Poznań, Poland, 24-28/06.1996

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CEMS AND RF-MÖSSBAUER STUDY OF NANOCRYSTALLINE FeZrBCu ALLOYS

The microstructure and magnetic properties of the nanocrystalline bcc phase formed as a result of annealing at 500-600°C of the amorphous $Fe_{93-x-y}Zr_7B_xCu_y$ (x = 6, 8, 12; y = 0,2) alloys are studied by Mössbauer spectroscopy. The unconventional rf-Mössbauer experiments in which the radio-frequency induced effects (rf collapse and rf sidebands) are used allow us to distinguish nanocrystalline bcc-Fe phase from magnetically harder microcrystalline α-Fe formed at higher annealing temperatures. The complete rf collapse of the magnetic hyperfine structure occurs only in the amorphous and nanocrystalline phase and is suppressed by the formation of microcrystalline α-Fe. The rf sidebands disapper when the nanocrystalline phase is formed, what reveals that magnetostriction vanishes. The rf-Mössbauer experiments performed as a function of rf field intensity allowed the determination of the distribution of anisotropy fields related to the size distribution of the bcc-Fe grains. The conversion electron Mössbauer spectroscopy (CEMS) is used for studying the surface crystallization of FeZrBCu alloys. Clear differences observed between the bulk and surface crystallization are discussed in detail.

Materiał prezentowano na sesji posterów.
Tekst będzie wydrukowany w: Acta Physica Polonica A 1997 r.

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IC-SLCS-7/7th INTERNATIONAL CONFERENCE ON SHALLOW-LEVEL CENTERS IN SEMICONDUCTORS Amsterdam, The Netherlands, 17-19/07.1996

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INVESTIGATION OF As-PRECIPITATES IN SI GaAs BY LST METHOD

SI GaAs crystals are grown by LEC method from As-rich melt. These crystals contains high density of arsenic precipitates - $10^8 cm^{-3}$. It causes the decreasing of the yield in products of integrated circuits. For this reason As precipitates density became the important parameter characterizing the quality of SI GaAs crystals and wafers.

In this work As-precipitates have been investigated by laser scattering tomography (LST). For this method a compact optoelectronics device was designed and made. The YAG laser, illumination and observation optics, CDD camera and all mechanical movements devices were combined in one unite. It enabled to observe the scattered objects inside the GaAs wafers.

The investigation of As-precipitates by LST have been made on"as grown" and on thermally annealed crystal and wafers. As the results the images of precipitates behavior in the material were obtained. Density of this defects was also evaluated.

The results obtained by LST method were correlated with microscopic observations of the wafers etched by AB solution and macro-cathodoluminescence images. Defects identification was performed by TEM. The quantitative evaluation of precipitates volume density of the crystals and wafers was made according to the computer program.

Materiał prezentowano na sesji posterów.
Tekst wydrukowano w materiałach z konferencji.

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LASER INTERFEROMETRY VIII CONFERENCE: TECHNIQUES AND ANALYSIS, Denver, CO, USA, 04-09/08.1996

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APPLICATION OF IMAGING CONOSCOPE FOR OPTICAL INHOMOGENEITY TESTING IN $LiNbO_3$ CRYSTALS AND COMPONENTS

Good optical homogeneity (usually $2.5x10^{-5}$ cm^{-1} or better (Shen Y.R., 1984) is important in many applications of uniaxial crystals (polarizers, 2nd harmonic generators, electrooptic devices). Due to large thermal gradients accompanying growth of crystalline boules, resulting in nonhomogeneous distribution of residual stresses and dopants (ions), a certain optical inhomogeneity always occurs in larger areas of growing crystals. Also due to a high cost of mechanical treatment of crystals (grinding, cutting, lapping, polishing) it is necessary to apply a quick and nondestructive method for assessing the magnitude and locations of such inhomogeneities in crystals as grown, prior to any further components manufacture.

A conoscope operating at laser diode wavelength of 660 nm and using CCD and video-framegrabber imaging techniques has been applied for investigation of optical inhomogeneity spread distribution (stepping motors move a crystal in a plane perpendicular to the conoscopic light beam) in $LiNbO_3$ crystals pulled by the Czochralski method in either Z or Y direction. Analysis of the conoscopic images is being performed by using unsimplified formulas. By acquiring two optical inhomogeneity maps for each crystal: in directions of its optical Z-axis, and perpendicular to it (usually Y-axis), respectively, it's possible to eliminate defected and stressed crystals areas. Such investigations has been utilized practically for selection of crystals and optical components, optimization of the growth technique, as well as in some experiments including investigation of influence of crystal perfection on its performance n a practical device.

Materiał prezentowano na sesji posterów.
Tekst będzie wydrukowany w: Proceedings SPIE 1997 r.

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ISCS'23/23rd INTERNATIONAL SYMPOSIUM ON COMPOUND SEMICONDUCTORS, St Petersburg, Russia, 23-27/09.1996

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THE INFLUENCE OF THERMAL ANNEALING ON THE As - PRECIPITATES BEHAVIOR IN SI GaAs

Commercially available semi-insulating gallium arsenide substrates are proposed from ingots annealed after growth. This post growth annealling is generally expected to bring definite improvements in material uniformity, which are attributed to a redistribution of defects. Multiple annealing (MWA) is proposed as competitive process for further improvement GaAs substrates. In this work the influence of thermal annealing procedure on the As - precipitates behavior in conventional ingot annealed and MWA GaAs was investigated. Undoped or Cr, V, O_2, In doped GaAs bulks and wafers 2" and 3" in diameter were annealed.

Thermal annealing process was carried out in closed quartz ampules at temperature range 800-1150°C in time 4-20 h under arsenic pressure 0.5-1.5 atm.

As - precipitates in GaAs wafers were investigated by laser scattering tomography (LST), Nomarski contrast microscopy after etching in AB solution, cathodoluminescence (CL) and transmission electron microscopy (TEM). Main results obtained in this work can be summarized as follows:

- by TEM As - precipitates were identified as the particles placed on the dislocations,
- contrast Nomarski microscopy and LST images showed strong influence of thermal annealing process parameters on the As - precipitates density,
- there is a big difference of As - precipitates density in the wafers and bulk crystals after annealing process. It is due to the difference in diffusion rate of As from the wafer and crystal,
- the cathodoluminescence images indicate the improvements in the homogeneity of GaAs wafers as the result of the annealing process.

Thermal annealing influence on the As - precipitates density is much more effective for the wafers, than for GaAs ingots.

Materiał prezentowano na sesji posterów.
Tekst będzie wydrukowany w: Proceedings ISCS 1997 r.

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PIEZO'96/9th PIEZOELECTRIC CONFERENCE
Waplewo, Poland, 2-4/10.1996

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SURFACE ACOUSTIC WAVE RESONATORS ON ST CUT QUARTZ

Surface acoustic wave (SAW) resonators are high Q components used for frequency control in oscillators. They are used as VHF/UHF local and voltage controlled crystal oscillators and low power transmitters in the frequency range from about 200 MHz to 1000 MHz. Several models of SAW resonators on ST cut quartz were designed, fabricated and tested, and the results will be presented in this paper. The resonators are synchronous type, and two port or one port. The resonators were designed by using the scattering analysis method. Masks were fabricated by means of electron beam lithography, and lift-off photolithography was used for aluminium pattern deposition on ST cut wafers (76 mm in diameter). After cutting, the SAW resonator chips were mounted in TO-8 metal packages and hermetically seald by cold welding in the vacuum. The resonators were designed for frequences 303 MHz, 357 MHz, 512.5 MHz and 715 MHz. Parameters of the resonators were measured in a 50 Ω system (HP 8752A Network Analyser). The two port resonators were measured in a transmission mode. In the above frequency range, the insertion loss was equal to about 8 dB, and unlouded Q varied from about 15000 to 6500. The one port resonators are obtained from the two port ones by parallel connection of the synchronous interdigital transducers, or by short circuiting one of the transducers. The connection is made outside the TO-8 package. These resonators were measured in the reflection mode. The unloded Q varied from about 15000 to 5500, and the resistance was in the range from 15 Ω to 60 Ω, in the above frequency range. It was confirmed, that copper doped aluminium metallization has improved aging compared to the pure aluminium case.

Materiał prezentowano na sesji posterów.
Tekst wydrukowano w materiałach z konferencji.

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CSSC/XII - CONFERENCE ON SOLID STATE CRYSTALS MATERIALS SCIENCE AND APPLICATIONS Zakopane, Poland, 07-11/10.1996

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INVESTIGATION OF THE THERMAL PROPERTIES OF SOLIDS TRANSPARENT TO ELECTROMAGNETIC RADIATION

The investigation of thermal properties of solids are complicated in the case of materials owing extremal physical properties. These are first of all - metals, i.e. the solids nontransparent to electromagnetic radiation and owing high thermal conductivities. On the contary, there is a vest group materials with a very low thermal conductivity. On the other hand, there are composites, manufactured on the basis of materials with quite different physical properties, especially the thermal conductivity. A special group of materials are the ones transparent to the electromagnetic radiation in the specified wavelength spectrum. It is an important problem to develop a specified measuring procedure of those materials.

In this work a special methodology comprising computing procedures that increase accuracy of determination of thermal parameters of these materials has been applied. The measurement of the thermal properties has been carried out using on own apparatus completely developed and constructed in the IEMT. The incread range of the parameters measured by the equipment was achieved by using the white-light electromagnetic radiation source with regulated power-output and a spectral characteristic. A new original method for determination of the temperature inside a sample, being a part of he novel measuring technique has been used in those investigations.

Materiał prezentowano na sesji posterów.
Tekst wydrukowano w materiałach z konferencji.

GAS SYSTEMS FOR TRT AND MSGC DETECTORS - SLOW CONTROL AND MONITORING WORKSHOP Kraków, Poland, 10-12/10.1996

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TECHNOLOGY OF MICROSTRIP METALLIZATION FOR MSGC

Electron beam writer has been used to transfer the designed pattern of the MSGC microstrips on a glass substrate. The profile of the edge of an e-beam resist enables either lift off of the subsequent metallization or conventional etching. The mixed technique (comprising both lift off and etching) has been proposed and successfully applied to evaluate microstrips of MSGC that have smooth edges and a low resistance.

Materiał prezentowano na sesji posterów.
Tekst wydrukowano w materiałach z konferencji.

DEFORMATION AND FRACTURE IN STRUCTURAL PM MATERIALS INTERNATIONAL CONFERENCE Stara Lesna, Slovakia, 13-16/10.1996

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REACTIONS TAKING PLACE IN THE TRANSITION LAYER DURING ACTIVE BRAZING OF ALUMINA CERAMICS WITH METALS

Reactions occurring within the transition layer between alumina, active solder and the FeNi42 alloy were investigated. The active constituent of the Ag Cu filler alloy was Ti. After the brazing some oxided compounds and intermetallic compounds were identified in the transition layer. The oxide compounds were primarily titanates, such as cuprous titanate, cupric-cuprous titanate and ferrous titanate. Among the intermetallic compounds, titanium-iron and titanium-nickel compounds were found. Is is suggested that the complex Ti-Cu-O compounds are responsible for the mechanical strength of joints.

The element concentration profiles over the cross sections of the alumina (active braze) FeNi42 alloy joints and the variation of these profiles with the brazing temperature and time were examined. The concentration profiles were used to find how individual elements migrate within the transition layer.For some joints the diffusion

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coefficients were calculated based on the concentration profiles.

Materiał prezentowano na sesji posterów.
Tekst wydrukowano w materiałach z konferencji.

1st POLISH - KOREAN SYMPOSIUM ON MATERIALS SCIENCE Warszawa, Poland, 16-20/12.1996

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SUBSTRATE OXIDE CRYSTALS FOR HTSc AND GaN THIN FILMS

Polycomponent oxides of $SrLaAlO_4$ (SLA), $SrLaGaO_4$ (SLG), $NdGaO_3$ (NGO), $LiAlO_2$ (LAO), $LiGaO_2$ (LGO) have been found, recently, as attractive substrates for HTSc and GaN thin layers, respectively. It is pointed out that crystals of SLG and NGO used as substrates for HTSc are the proper substrates for GaN films. Crystals are grown by Czochralski method and anisotropic properties of compounds play an important role in case of SLA and SLG in the growth of good quality crystals.

Morphology of these crystals of pseudoperovskite structure depend on ionic-covalent character of bonding and crystal growth parameters. Point defects are observed in crystals and they are reflected in color changes (colorless, yellow, green). Point defects are detected in directions perpendicular to oxide planes and are connected with instability of oxygen position in lattice. Results of ESR and optical spectroscopy investigations are presented [1, 2].

Most oxides of the same crystal structure form solid solutions which exist in solid state, however, crystal growth is only limited to very low solubility (0.1 mol % or less) these cations in host lattice. In the case of crystals of pseudoperovskite structure the solubility does not only depend on ionic radii but it is assumed that electron structure of cations influences the stability of crystal structure.

It is pointed out that crystal growth process of polycomponent oxide crystals by Czochralski method depends on the preparation of melt and its stoichiometry, orientation of seed, gradient of temperature at crystal-melt interface, parameters of growth (rotation and pulling rate) and control of red-ox atmoshpere during seeding and growth. Growth parameters have an influence on the morphology of crystal-melt interface, type and concentration of defects.

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Materiał prezentowano na sesji komunikatów.
Tekst wydrukowano w materiałach z konferencji.

1st POLISH - KOREAN SYMPOSIUM ON MATERIALS SCIENCE Warszawa, Poland, 16-20/12.1996

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STATE OF THE ART OF FIBER OPTIC TECHNOLOGY IN INSTITUTE OF ELECTRONIC MATERIALS TECHNOLOGY

In this paper it has been presented results of scientific and technological experiments provided in Glass Department of the Institute of Electronic Materials Technology in Warsaw.

Researches on fiber optics elements are carried out in the following areas:
1. light guides from mulicomponent glasses,
2. light guides from pure silica glasses,
3. light guides from nonoxide glasses.

It has been elaborated the laboratory methods of manufacturing glass elements which were starting preforms for optical fibers.

Above methods include:
- selection of proper chemical composition of glasses,
- preparation of optimum material batches,
- melting of glasses in platinum or ceramic crucibles,
- mechanical working (grinding and polishing) of glass blocks for getting rods for "rod in the tube" preforms. It has been also improved methods of pulling glass fibers of different cross sections for several medical, technical and environmental applications.

A high level of technique and technology skills in manufacturing optical fibers made possible to obtain higher generation of optical fiber elements may possibly transmit image or sensor signals.

Materiał prezentowano na sesji komunikatów.
Tekst wydrukowano w materiałach z konferencji.

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1st POLISH - KOREAN SYMPOSIUM ON MATERIALS SCIENCE Warszawa, Poland, 16-20/12.1996

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ADVANCE IN TECHNOLOGY OF SEMIINSULATING GaAs AND InP

Gallium arsenide (GaAs) and indium phosphide (InP) are very important materials for optoelectronic and microwave devices. Special interest is in application of semiinsulating crystals (SI GaAs, SI InP) for manufacturing of high speed electronic and optoelectronic Integrated Circuits (IC). For these applications obtaining large size semiinsulating crystals and wafers, with high electrical parameters and structure perfection is necessary. IC's constructed by direct ion implantation need the wafers with uniform electrical properties.

Liquid Encapsulated Czochralski (LEC) technique is widely used for manufacturing of SI GaAs and SI InP crystals. Starting policrystalline material is synthesized by "in situ" or injection method. LEC technique is suitable for growing very large crystals with high yield but they include many structural defects such dislocation, precipitates, and residual strains because of growth under the large temperature gradients. To obtain big crystals with improved parameters and high yield it is important to know, how thermal gradients and the other technological factors influence on the material. This knowledge is necessary for optimization and computerization of the processes. Improvement of electrical parameters of SI GaAs or SI InP is possible by post growth thermal annealing of the crystals and/or wafers. Heating impurities and AS or P precipitates material become more uniform.

Characterization of semiinsulating crystals for IC's applications is made by electrical and optical measurements. The following parameters are measured:

- resistivity ( ) and mobility (H) using van der Pauw method,
- sheet resistance distribution (form the two-sonde measurements),
- concentration and distribution of EL2 centers at EL20 and EL2+ state from near infrared absorption measurements at 300 K in GaAs,
- carbon concentration (by LVM measurements),
- concentration and distribution of Fe in InP,
- etch pits density (EPD) distribution,
- As - precipitates by LST technique,
- application test (by IS-D current for FET transistors).

The problems connected with synthesis, crystal growth, thermal annealing and

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methods of characterization are the subjests of the research work in Institute of Electronic Materials Technology.

Materiał prezentowano na sesji komunikatów.
Tekst wydrukowano w materiałach z konferencji.

1st POLISH - KOREAN SYMPOSIUM ON MATERIALS SCIENCE Warszawa, Poland, 16-20/12.1996

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ADVANCES IN SILICON TECHNOLOGY AT ITME

Silicon technology is one of the main fields of ITME activity. As a result, high quality of Czochralski-grown single crystals and silicon waters are obtai- ncd. Apart from that, an advanced technology of silicon epitaxial growth has been developed, so TTME is capable of manufacturing epitaxial layers with a thickness from 0.5=100 μm and various doping profile. Metal contaminants, in particular transition metal impurities, are controlled by Deep Level Transient Spectroscopy (DLTS). DLTS measurements are specially useful in a quality control of high resistivity epitaxial layers used in power devices with resistivity of 100 Ωcm and thickness above 100 μm. Combined with other techniques, for example FTIR absorption measurements of the interstitial oxygen concentration, DLTS gives information on local change of the deep levels in the region on the wafer where enhanced internal gettering effect has occurred. In searching of new silicon applications some work on a porous silicon has been done. The porous layers fomied in p^- type epitaxial layer deposited on p^+ type substrate emit efficient light in visible range under laser or UV excitation. Because of the large intemal surface, porous silicon is easy to etch off which is used in silicon sensors made be micromachining, for example in the bolometer construction. Porous silicon maintains the monocrystalline nature of the silicon substrate. The epitaxial layers were grown over porous silicon in the standard epitaxial reactor. A structure consisting of monocrystalline substrate - oxidized porous Si layere - monocrystalline epitaxial layer are used in SOI devices.

Materiał prezentowano na sesji komunikatów.
Tekst opublikowano w materiałach z konferencji.

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1st POLISH - KOREAN SYMPOSIUM ON MATERIALS SCIENCE Warszawa, Poland, 16-20/12.1996

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LOW-DIMENSIONAL HETEROSTRUCTURES OF III-V SEMICONDUCTOR COMPOUNDS PRODUCED BY MOVPE EPITAXY

Low-dimensional heterostructures of III-V semiconductor compounds have become the core of modem electronic devices. Constant optimization of growth technology stimulates the creation process of new devices ideas in micro- and opto-electronics. High technical level of equipment and high purity of starting materials enabled MOVPE method to be nowadays commonly applied in reali- zation of extremely sophisticated configuration of heterostructures including nano-metric quantum wells and super-lattice. The know-how of the smooth, abrupt interface, apart from ideal structure and low back-ground impurities level, is the basic feature of a modern epitaxial growth of low-dimensional heterostructures.

In the paper selected problems related to the growth of various III-V compounds from technological point of view are presented. Experimental results dealing with GaAs, InP, GaAs, InGaAs and others showed here, were obtained at the Institue of Electronic Materials Technology.

Materiał prezentowano na sesji komunikatów.
Tekst wydrukowano w materiałach z konferencji.

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