

Sakhanski S. P. *Management Model form in Growing Single Crystals Germany* 2

The model of formation temperature on the job installing crystal growth of germanium by the method of "CZ", which allows control of the shape of crystals grown in the areas of direct and inverted cone.

Keywords: model, shape, growth, single crystal germanium

Kovalevsky A. A., Tsibulsky V. V., Vlasukova L. A., Strogova A. S., Luchenok A. R., Shevchenok A. A. *Nanosized Titanium Disilicide: Synthesis, Structure, Properrties. Part 2* 6

An effective way to create a titanium disilicide with semiconducting properties, which was tested as a photo-catalyst in the decomposition of water to hydrogen and oxygen has been proposed and implemented.

The mechanism of the water decomposition through the formation of an intermediate nanostructured catalyst $TiSiO_4$ has been considered.

Keywords: water, hydrogen, titanium disilicide, absorption coefficient, electrical resistivity, band gap

Averin I. A., Gubich I. A., Pecherskaya R. M. *Formation and Study of Porous Oxide Films on Aluminum* 11

The results of study of formation of porous aluminum on the bulk and film base in an aqueous solution of oxalic acid are presented. The common features of growth of the oxide film under conditions of changing the current density and voltage are founded.

Keywords: electrochemical anodization, porous oxide alumina, morphostructure, atomic-force microscopy, scan, model

Fetisov L. Yu. *Resonance Magnetolectric Effect in Composite Quartz-Ferromagnetic Structure* 14

Magnetolectric effect in layered composite structure consisting of piezoelectric quartz and amorphous magnetic alloy layers was investigated. It was shown that high acoustic quality of quartz leads to the significant increase in efficiency of magnetolectric interaction. Structures with quartz layers may be used for building magnetic field sensors and tunable resonators.

Keywords: magnetolectric effect, composite structure, quartz, amorphous magnetic, magnetic field sensors

Eremkin V. V., Galii I. V., Nagaenko A. V., Panich A. A., Smotrakov V. G., Philippov S. E., Shilkina L. A. *Low Temperature Sintering of PZT Ptezoceramics, Intended for Co-Fired Multilayered Actuators* 17

It has been studied the influence of dispersion and phase structure of lead zirconate-titanate (PZT) powders, obtained by the methods of chemical coprecipitation of metal hydroxides and solid state synthesis, on conditions of sintering, microstructure and properties of piezoelectric ceramics. The considered methods of synthesis allow to lower temperature of ceramics sintering down to 1000 °C at conservation of high piezoelectric activity.

Keywords: actuator, piezoelectric, ferroelectric, ceramics, lead zirconate-titanate, microstructure, high energy milling

Tkacheva A. A. *Plasma Etching of GaN and its Solid Solution: Progress and Prospects* 21

This work investigates the review of the literature on the plasma etching of GaN and its solid solution includes a description of the various sources, modes and gases used to the plasma etching of nitride group materials, the issues of the etching quality and the application of plasma etching in the production technology of modern HEMT transistors.

Keywords: gallium nitride (GaN), dry etching, inductively coupled plasma

Godovitsyn I. V., Amelichev V. V., Pankov V. V., Saurov A. N. *A Novel Surface-Micromachined Tenzoresistive Pressure Sensor* 26

A novel recently proposed SOI-based surface-micromachined tenzoresistive pressure sensor is fabricated. The sensor comprises monocrystalline silicon tenzoresistors and polysilicon membrane. The sensor is fabricated using surface-micromachined technology, with single-side processing of SOI-wafer. Two sensor designs are realized — with and without a circular boss made of thick deposited SiO_2 layer placed upon the membrane. Sensor characterization is performed by measurements of output curve at +20 °C, -50 °C и +60 °C. Both sensor designs demonstrate sensitivity about $24 \text{ mV} \cdot (\text{V} \cdot \text{atm})^{-1}$. The influence of technological factors on the performance of the sensor is analyzed.

Keywords: miniature pressure sensors, surface micromachining technology

Voytsehovskiy A. V., Kulchitsky N. A., Melnikov A. A., Nesmelov S. N., Dzyaduh S. M. *Photodetectors and Photodetector Devices for the Spectral Range 0,19...1,1 Microns on Silicon Photodiodes and InGaN Solid Solutions* 30

The analysis of the current state and trends of photodetectors and focal plane array for the spectral range 0,19...1,1 micron on silicon-based $p-n$, $p-i-n$ -photodiodes and on solid solutions InGaN photodiodes was carry out.

Keywords: photodetector, focal plane array, silicon photodiodes, $p-i-n$ -photodiodes, solid solutions InGaN photodiodes

Italiantsev A. G., Shulga Yu. V., Fetisov Yu. K., Chashyn D. V. *Magnetic Field Sensor Based on Piezoelectric Transducer and Multiturn Electromagnetic Coil* 41

A design of MEMS sensitive to magnetic field is described. Its principle of operation is based on piezoelectric effect and Ampere force combination. Physical and design principles of such devices' sensitivity to magnetic field increasing are theoretically grounded and proved in practice. Canonical expression is deducted for sensitivity of primary transducers based on bending piezoelement and multiturn coil with transducer's resonant frequency alternating current. Experiments demonstrated proposed MEMS sensitivity up to 10^4 V/T · A that is much higher compared to existing sensors.

Keywords: magnetic field sensor, PZT ceramics, piezoelectric element, bimorph structure, multiturn electromagnetic coil, Ampere force

Burlakov I. D., Voytsehovskiy A. V., Nesmelov S. N., Grinchenko L. Ya. *Ultraviolet Detectors Based on AlGaN $p-i-n$ -Structures* 46

The analysis of technologies and characteristics of the "solar-blind" and "visible-blind" detectors based on $p-i-n$ -structures of AlGaN was carry out. The focal plane array based on $p-i-n$ -photodiodes, as well as studies on the creation of avalanche photodiodes based on pin structures of AlGaN was considered.

Keywords: AlGaN, "solar-blind", "visible-blind" detectors, $p-i-n$ -structures, photodiodes

For foreign subscribers:

Journal of "NANO and MICROSYSTEM TECHNIQUE" (Nano- i mikrosistemnaya tekhnika, ISSN 1813-8586)

The journal bought since november 1999.

Editor-in-Chief Ph. D. Petr P. Maltsev

ISSN 1813-8586.

Address is: 4, Stromynsky Lane, Moscow, 107076, Russia. Tel./Fax: +7(499) 269-5510.

E-mail: nmst@novtex.ru; http://novtex.ru/nmst/

Адрес редакции журнала: 107076, Москва, Стромьинский пер., 4. Телефон редакции журнала (499) 269-5510. E-mail: nmst@novtex.ru
Журнал зарегистрирован в Федеральной службе по надзору за соблюдением законодательства
в сфере массовых коммуникаций и охране культурного наследия.
Свидетельство о регистрации ПИ № 77-18289 от 06.09.04.

Дизайнер Т. Н. Погорелова. Технический редактор Е. М. Патрушева. Корректор М. Г. Джавадян

Сдано в набор 18.04.2012. Подписано в печать 23.05.2012. Формат 60×88 1/8. Заказ МС612.

Цена договорная

Оригинал-макет ООО «Авансед солюшнз».

Отпечатано в ООО «Авансед солюшнз». 105120, г. Москва, ул. Нижняя Сыромятническая, д. 5/7, стр. 2, офис 2.