

Verner V. D., Malcev P. P., Reznev A. A., Saurov A. N., Chaplign Yu. A. Modern Tendencies in Development of Micro System Technique 2

Main changes and tendencies in development of micro system technique by 2008 are considered. It is stressed essential increasing role of electronic component MEMS construction according to including self-testing systems and development of interface wireless devices for connection. Tendency to constant decreasing of the cost needs in search of new fields of MEMS application (home technique), new materials (polymers) and new technological solutions. Production of MEMS as before per 80% based on micro treatment of silicon, according this mastered technologies of framework on the wafer and 3D-assemblage. Big firms use now in production 200 mm (diameter) wafers. Positive and negative aspects of indicated tendencies are considered.

Keywords: microsystem technique, microelectromechanical systems, wireless systems, autonomous sources of energy, self-testing.

Tarnavsky G. A. On the Way to Nanoelectronics: Possible Growth Points 7

We debate a number of aspects of the paper of Ju. R. Nosov, and A. Ju. Smetanov "On the way to nanoelectronics (historical parallels and comparisons)".

Keywords: nanoelectronics, nanotechnology, nanomaterial, nanoscience.

Belyanin A. F., Samoylovich M. I., Krivchenko V. A., Paschenko P. V., Suetin N. V., Timofeev M. A. Nano-Structured ZnO Films in Mirrors and UV-Emission Sensors 9

Conditions of ZnO films synthesis by RF-magnetron sputtering with additional magnet system application behind the substrate holder are considered. The influence of ZnO films structure on exploitation characteristics of sensitive elements of UV-emission sensors and UV-range mirrors is studied.

Keywords: ZnO films, magnetron sputtering, microelectronics and optical devices.

Belous A. I., Emelyanov V. A., Drozd S. E., Konnov E. V., Mukhurov N. I., Plebanovich V. A. VLIC Schematic Design of Capacitor-Voltage Converter for Microelectromechanical Sensors 15

The article reviews the issues of the schematic designing of the VLIC capacity-voltage converter for the electronic circuit of the micromechanical sensor of general purpose.

The proposed VLIC structural diagram can be used for creation of MEMS with the capacitive output from the sensitive element.

Keywords: differential capacitor, capacity measurement of the differential capacitor, MEMS (microelectromechanical systems), technology of the integrated circuits.

Yashtulov N. A., Gavrin S. S., Labunov V. A., Revina A. A. Porous Silicon as Catalytic Nanomatrix in Micropower Sources 20

Results of platinum group nanocatalysts formation on the porous silicon matrix are presented. Opportunity of selective growth of carbon nanotubes is considered. It is shown, how polarity of conductivity, range of porosity and silicon porous shape effect on the catalyst nanoparticles characteristics used in power sources in electronics.

Keywords: nanotechnology, porous silicon, solid polymer micro fuel cell, nanotubes, nanoelectrocatalysis, inverse micelle solution, palladium nanoparticles, atomic force microscopy.

Sighov A. S., Verbitskiy S. S., Emohonov V. N., Shilyaev A. A. On the Problem of the Perspective (Maximum) Characteristics of the Thermal Detectors Electromagnetic Radiation 24

The possibility of manufacturing of thermal detectors of radiation with maximal detectability and with high speed of response was researched and by experiment. The relation between physical and geometrical sizes of sensitive elements of detectors at which function of transformation of electromagnetic energy does not depend on frequency was received.

The new combination of physical principles of energy absorption of radiation and its subsequent dispersion in the detector was offered.

Keywords: thermal detector, maximum detectability, high speed of response, width range of lengths of waves.

Vavilov V. D., Glazkov O. N. *The MEMS-Accelerometer Stochastic Error Reseaech*27

The object of this article is to research stochastic process effect, for example, white noise, on bias and scale factor of MEMS-accelerometer. On the first design phase data may be obtained prior to manufacturing prototypes used for experimental research.

Keywords: acceleration, stochastic, error, model, signal, parasitic signal, bandwidth, transfer function, MEMS, accelerometer, mean-square error, broad band, white noise, bias, spectral, intensity.

Anufrienko V. B., **Mihailova A. M.**, **Palagushkin A. N.**, **Sergeev A. P.**, **Sigeikin G. I.**, **Somov I. E.**, **Chernov V. A.**
Application of Super Multi-Layer Nano-Structures for Direct Nuclear-Electrical Energy Conversion30

Nano-technologies allow to solve one of the problems of direct nuclear-electrical energy conversion without thermal cycle. Application of thin layers (several hundreds Angstrom units) in electricity-generating elements allows to increase approximately in one hundred times the converter efficiency of nuclear batteries based on secondary electrons in comparison with "thick" layer batteries. It is advisable manufacture of hybrid electrical current sources including energy converters based on secondary electrons and super capacitors.

Keywords: direct nuclear-electrical energy conversion, secondary electrons, hybrid current sources, super-capacitors, multi-layer emitter — isolator — collector structures.

Samoylovich M. I., **Belyanin A. F.**, **Klescheva S. M.**, **Sergeeva N. S.**, **Sviridova I. K.**, **Kirsanova V. A.**, **Akhmedova S. A.**, **Urusov V. S.**, **Shvanskaya L. V.** *Application of Ordered SiO₂ Nanosphere Packings for Elaboration of Biocompatible Nanomaterials*38

In the work a probability of application of natural geyserrites and synthetic opal matrices for systems cultivation cellular, including mesenchymal cells, is shown. The features of growth and structure of systems "opal matrice (geyserite) — mesenchymal cell" are considered. It is revealed, that natural geyserrites, consisted of amorphous opal and characterized the disordered structure with system of pores of nano- and microsized, possess ability to execute the functions of skeleton — matrix for implanted cellular cultures as compared to synthetic opals — three-dimensional nanostructures based on cubic packing of SiO₂ nanospheres.

Keywords: opal matrixes, geyserrite, mesenchymal cells, nanostructures.

Trashin S. A., **Vagin M. Yu.**, **Karpachova G. P.**, **Ozkan S. Zh.**, **Karyakin A. A.** *New Method of Electrochemical Detection of Proteins and Nucleic Acids*49

The new approach for detection of proteins and DNA based on the electrodes, shielded by thin liquid organic film is proposed. The possibility for electrochemical registration of proteins due to their extraction into organic media is shown. The effect is useful for analytical proteins determination. Using shielded electrodes the new method of label-free electrochemical registration of DNA was elaborated. The new approach possesses a high sensitivity enough to distinguish the single mismatch oligonucleotide from complement.

Keywords: electroanalysis, protein electroactivity, interface between immiscible liquids, protein extraction, dna sensor.

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(495) 269-5510.

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

Адрес редакции журнала: 107076, Москва, Стромьинский пер., 4/1. Телефон редакции журнала (495) 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 *Л. М. Мазурина*.

Сдано в набор 20.06.2008. Подписано в печать 24.07.2008. Формат 60×88 1/8. Бумага офсетная. Печать офсетная.
Усл. печ. л. 6,86 Уч.-изд. л. 8,52. Заказ 858. Цена договорная

Отпечатано в ООО "Подольская Периодика", 142110, Московская обл., г. Подольск, ул. Кирова, 15