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Microsystems technology of direction development for application of microelectromechanical systems.

**Zaporotskova I. V.** *Structure and Electron-Energy Characteristics of Modified Alicyclic Nanotubes* . . . . . 13

Within the framework of molecular cluster model with the closure of uncompensated valences by hydrogen pseudo-atoms and semiempirical method MNDO-PM3 with full optimization of geometrical parameters the electronic structure and spectrum of one-electronic states of hypothetical nanotubes — polyalicyclic tubulenes — are investigated. The modifications of these nanotubes formed by substitution outside atoms of hydrogen on function groups  $\text{CH}_3^-$ ,  $\text{NH}_2^-$ ,  $\text{PH}_2^-$ ,  $\text{OH}^-$ ,  $\text{SH}^-$ ,  $\text{F}^-$ ,  $\text{NO}_2^-$ ,  $\text{CN}^-$ ,  $(\text{O})_2\text{Ti}(\text{Cl})_2$ ,  $(\text{O})_2\text{Cr}(\text{O})_2$ ,  $(\text{O})_2\text{Mn}(\text{O})_2\text{OH}$ ,  $(\text{O})_2\text{Fe}$ ,  $(\text{O})_2\text{Ni}$  and  $(\text{O})_2\text{Mo}(\text{Cl})_2$  in limits one, central, layer along a circle of a tube, are considered. The features of the electronic and energy spectrum of these nanotubes are discussed.

**Bakhtizin R. Z., Wu K.-H., Xue Q.-Z., Xue Q.-K., Sakurai T.** *Atomic Scale Characterization of Adsorption and Growth of Noble Metal Films on the GaN(001) Surface* . . . . . 19

The adsorption and initial stages of growth of noble metal films (Au, Ag) on the GaN(0001) surface with  $1 \times 1$ -Ga fluid structure were studied by using scanning tunneling microscopy and reflection high-energy electron diffraction. Both Au and Ag atoms show very high mobility and huge diffusion length on the surface which result in the formation of large Au and Ag islands at submonolayer coverage. Au is found to be more reactive with the surface, and a  $c(2 \times 12)$  alloy phase is found to coexist with the monolayer Au island. In contrast, Ag is less reactive and it does not form surface alloy with Ga, but it is more diffusive and induces the line-type Ag crystals.

**Zhukov A. A., Chetverov Yu. S., Kudrjavzhev P. N., Birulin P. V., Zdobnikov A. E., Babaevsky P. G., Obizhaev D. Yu.** *Method of Determination of Thermal Characteristics of Uncooled Semiconductor Microbolometers* . . . . . 24

The paper presents a method of determination of thermal characteristics of uncooled semiconductor microbolometers based on the use of a pulse mode with current stabilization. The paper studies performance of microbolometers with the following characteristics: pixel size —  $48 \times 48$  microns, thickness — 0,45 microns, width of legs —  $1,6 \div 2,0$  microns, distance to silicon substrate —  $2,0 \div 2,5$  microns, re-

sistance of vanadium-oxide-based sensitive element,  $100 \div 150$  kilohms. It is concluded that when residual pressure is below  $2,5 \times 10^{-3}$  Pa microbolometer thermal conductivity coefficient amounts to  $(1,54-2,93) \times 10^{-7}$  W/K; heating capacity —  $(1,55-1,92) \times 10^{-9}$  J/K, and thermal time constant (relaxation time) —  $5,7 \div 12,4$  ms.

**Mukhurov N. I., Efremov G. I.** *Modelling and Development of Perspective Microelectromechanical Structures of the Basis of Anodic Alumina* . . . . . 27

Features of construction of perspective microelectromechanical structures are analyzed on the basis of anodic alumina by results of modelling and theoretical calculation.

**Topolov V. Yu., Panich A. E., Kurbanov M. A.** *Features of Piezoelectric Properties of 0-3 Composites Based on the PCR-Type Ceramic* . . . . . 34

Concentration dependences of piezoelectric coefficients  $d_{3j}^*$  and  $g_{3j}^*$  have been determined for the 0-3 composite, containing a poled ferroelectric ceramic and a piezoactive polymer, within the framework of the model of spheroidal inclusions distributed regularly in a lengthy matrix. The PCR-7M and PCR-8 compositions (named "piezoelectric ceramic from Rostov-on-Don") have been considered as ceramic components. An influence of the shape and volume concentration of the inclusions on the piezoelectric response of the 0-3 composite has been analyzed. A comparison of some results of calculations and experimental data on the related piezo-composites has been carried out.

**Sajnev S. V., Fomichev M. A., Timofeev V. N.** *Application of Threadlike Primary Converters in Thermal Based Mass Flow Controllers* . . . . . 39

Threadlike primary semi-conductor and metal converters for physical sizes are considered. It is shown, that their use is perspective in development of more exact batching of a gas stream of thermal-conductivity detectors in the process equipment of microelectronics.

**Yushin K. D., Latsanev E. V.** *The Terminological English-Russian Mems&Nems Dictionary* . . . . . 43

In dictionary are given the terms and most widely used phrases and abbreviations of micro- and nanosystems and their fabrication.

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