CONTENTS

In our work we have investigated some aspects of carbon nanotube growth on thin film catalysts for integrated nanoelectronics. We have analyzed how ultrathin film dispersion influence nanotube diameter when system is heated up to 650 °C. We have found out the dependence between thin film roughness and nanotube diameter. Also methods of planar nanotube synthesis on multilayer catalysts Cr—Ni—Cr were developed.
Keywords: nanotubes, catalyst, chemical deposition, thin films

Experimental results of the investigations of the photon-phonon interaction in orderly packed silica dioxide (opal matrices) and nanocomposites on their base are presented. Effective conversion of laser light into acoustic vibrations of nanospheres, composing matrix, is shown to exist in such structures. Frequency shifts of the scattered light components are shown to correspond to the nanospheres vibrations eigenvalues. Stimulated scatterings of light generation in opal matrices dependence on the band-gap position is investigated.
Keywords: opal matrices, nanocomposites, acoustic effects

Technology of creation of polymer coating on based poly-p-ksylylene and chlorine modified poly-p-ksylylene on uneven substrate surface is developed. Coating with thickness 50 nm — 50 μm is obtained by vapor deposition polymerisation (VDP) method. Poly-p-ksylylene coating possess by humidity resistance, optical transparent, mechanical and electric strength, chemically inertness for most solvents, acids, and other outstanding properties. In thin poly-p-ksylylene film is obtained temperature resistance dependence with violently nonlinear character; hence, it can be used as thermo sensor. Film of poly-p-ksylylene can well be used as humidity resistance coating for optical and electronic devices.
Keywords: polymer films, poly-p-ksylylene, protective coating, temperature resistance dependence, thermo sensor

The simple and physically clear "effective particle" model in nanocomposites polymer/organoclay was proposed. Although the indicated model gives the same characteristics as and elaborated earlier treatments, but it takes into consideration interfacial adhesion polymer-organoclay level and not uses old-fashioned micromechanical models.
Keywords: nanocomposite, organoclay, polyethylene, "effective particle", interfacial adhesion

Problems of using criteria absolute stability of automatic control systems for Deformation electroelastictransducer for nano- and microdisplacements are discussed. Main features and principles of absolute stability of these systems are given.
Keywords: electroelastictransducer, control systems for deformation, nano- and microdisplacements, absolute stability

The model of limit phase boundary is offered as structural second-order phase transition, which corresponds to the border of section of phases with the infinitesimal changes of parameters of crystalline grate. On the example of ferroelastic $BiVO_4$ we obtained the equalizations of limit phases boundaries forming four orientation states are got.
Keywords: equalization of phase boundary, seconf-order phase transition, $BiVO_4$

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