CONTENS

E.A.Kudrenko, V.Roddatis, A.A.Zhokhov, I.I.Zverkova, I.I.Khodos, G.A.Emelchenko
SYNTHESIS AND MORPHOLOGY OF SIC NANOWIRES UNDER CARBOTHERMAL REDUCTION
SILICON DIOXIDE **5**

Synthesis of SiC nanocrystals by carbothermal reduction of colloidal silica at temperature of 1700, 2100 и 2200K has been studied. The nanocrystals at 1700K a shape of nanowires of a diameter between 20 and 200 nm an a length of tens to hundreds of microns. The X-ray diffraction (XRD) and transmission electron microscopy (TEM) analysis have shown the beta-SiC structure of the nanowires with a high density of stacking faults.The three types of the nanowires have been found: (i) - hexagonal nanowires with the [111] growth direction; (ii) -nanobelts with a rectangle-like cross-section and the [110], [112], [113] or the [331] growth directions; (iii) - «bamboo-like» nanowires, formed by wide segments with the perfect beta-SiC structure. Enhancing the process temperature up to 2100-2200K leads a major change in the SiCnanocrystal morphology. A thermodynamic analysis of possible reactions in the system was performed. Special attention was paid to nucleation sites and growth mechanism of nanowires (p. 5-22; fig. 13).

V.V.Chesnokov, A.S.Chichkan, V.I.Zaikovskii, E.A.Paukshtis, V.N.Parmon
FABRICATION OF CNT-SiO_2 COMPOSITES WITH USE
OF OLIGOMETHYLHYDRIDESILOXANE AS THE PRECURSOR OF SiO_2 ..... **23**

A new method of fabrication of CNT-SiO_2 composite is developed. The oligomethylhydridesiloxane (OMHS) was used as the precursor of SiO_2. The presence of active hydrogen in the composition of OMHS made it possible to reach the chemical interaction between the surface of carbon nanotubes and the deposited layer of the silicon oxide. An effect of the silicon oxide film on the oxidizing ability of CNT is studied. It is found that the oxidation rate of the CNT-SiO_2 composite decreases approximately by an order of the magnitude in comparison with the virgin CNT. The morphology and structure of the amorphous silicon oxide obtained after oxidation CNT-SiO_2 composite were studied. The thermal stability of the CNT-SiO_2 composite was also studied. It is found that the CNT-SiO_2 composite is thermally stable up to temperatures of 1100-1200 °C. An increase in the temperature of head tempering to 1300 °C leads to separation of CNT-SiO_2 composite into individual components: CNT and particles of SiO_2 (p.23-32; fig. 8).

V.S.Popov, V.G.Sevastynov, N.T.Kuznetsov
SYNTHESIS OF NANOSTRUCTURED SnO_2 COATINGS THROUGH
NEW VOLATILE PRECURSORS BY APCVD WITH INDUCTION HEATING **33**

In this paper four volatile tin coordination compounds $[Sn(AcAc)_2Cl_2]$, $[Sn(H_2O)_2Cl_4]\cdot 18K6$, $[Sn(18K6)Cl_4]$, $[Sn(H_2O)_2Cl_4]\cdot 15K5$ were synthesized and identify. Synthesized compounds were used as new precursors for tin dioxide coatings in atmospheric pressure chemical vapor deposition (APCVD) at the facility with induction heating in destruction zone. The coatings were characterized with physicochemical methods of analysis. Relationship of coatings morphology and precursors was investigated (p.33-43; fig. 6).

L.V. Lesnyakova, T.A. Akopova, N.S.Perov, G.A. Vikhoreva, A.N.Zelenetskii
AN EFFECT OF CONDITIONS OF SOLID-STATE SYNTHESIS OF GRAFT COPOLYMERS CHITOSAN
AND POLYVINYL ALCOHOL ON THEIR STRUCTURE AND SOLUBILITY **44**

Water-soluble graft copolymers of chitosan and polyvinyl alcohol were obtained in an experimental twin-screw extruder, in which pressure and shear strains were applied. On the first stage, the reaction mixture of solid NaOH and chitin was treated. To a product produced chitosan alkaline PVA was added and re-extruded. An effect of ratio of the components of reaction mixtures and MM PVA source on structure and properties of the products were examined by elemental analysis, measuring viscosity, IR spectroscopy, NMR and gel - chromatography (p. 44-55; fig. 6).

ON GRAPHITISING PAN-CARBON FIBRES **56**

X-ray powder diffraction patterns of boron-containing carbon fibres were analysed using the Rietveld method. Rietveld refinements confirm possibility of carbon fibers contained boron to graphitization at high temperature. A age of the Rietveld refinement technique allows revealing that the structure of carbon fibres is better described by the rhombohedral model of graphite structure (p. 56-62; fig. 3).

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