Nanocomposites and nanomaterials

The Complex of Thermal, Physical and Mechanical Properties of Nanocomposite Polychlortrifluoroethylene - SnO_2

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Polymer oxide nanocomposites with desired physical and mechanical and thermal properties of the nanopowder and low-fillers show high rates of protective and absorbent properties. The method of synthesis of nanosized tin dioxide has been proposed. By X-ray diffraction analysis conducted quality control parameters and nanoparticles [1,2]. Polymer nanocomposites polychlortrifluoroethylene (PCTFE) - tin dioxide (SnO_2) obtained by hot pressing. Are investigated experimentally density and total moisture received composites.

Concentration dependence of physical and mechanical properties of the nanocomposites obtained were investigated experimentally. By ultrasonic method determined the propagation velocity, the absorption coefficient, the complex modulus of elasticity, the tangent of the angle of mechanical losses, and the jump in the absorption of ultrasound as the frequency changes.

In order to more detailed analysis of events affecting the change in properties of nanocomposite additionally conducted calorimetric research of nanocomposites with different filler concentrations and their components in pure form. Demonstrate the expression of reverse structural changes in the system, accompanied by substantial heat release and loosening matrix.

The obtained polymer oxide nanocomposites are characterized by low porosity and high levels of physical and mechanical characteristics. This allows to operate the system of composites PCTFE - SnO_2 for large loads in difficult weather conditions and in the presence of aggressive environments.

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2. *I.F. Myronyuk, V.L. Chelyadyn, V.O. Kotsyubynsky, L.I. Myronyuk.* Structure and Morphology of SnO_2 Particles Prepared by Pyrogenic and Liquid-Phase Methods // Physics and Chemistry of Solid State. -2011.- **12**,N 1. - P. 174-181.