PREPARATION OF NANOPOWDERS SUSPENSIONS WITH HIGH STABILITY

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The rapid development and introduction of nanotechnologies requires new knowledge about biological and physicochemical properties of manufactured nanomaterials. One of the key issues of (eco)nanotoxicology is to accumulate experimental data about nanoparticles behavior in liquid surroundings. It is necessary to prepare suspensions with specified dispersion and rheological properties for the study of ecotoxicological properties of superfine material. In this paper we establish the features of aggregation and sedimentation stability of aqueous suspensions of industrial nanopowders, depending on the sample preparation conditions. The object of investigation is differently sized alumina nanopowders: an average particle size is from 30 to 150 nm. We show the effect of synthesis conditions, morphology, particle size, and the presence of low molecular weight surfactant in the dispersion medium on dispersion and electrokinetic properties of nanoparticle suspensions. Sedimentation and aggregate stability of obtained suspensions is measured by the change in the particles size distribution (laser diffractometer SALD-7101 Shimadzu, Japan), zeta potential of particles in suspensions (NanoSetaSizer Malvern analyzer), and the degree of dispersed phase precipitation in the prepared suspensions using a digital spectrophotometer APEL PD – 303.
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PRESENTATION OF INDIUM TIN OXIDE POWDER COMPACTION BEHAVIOR

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Presentation of compaction behavior of Indium Tin Oxide (ITO) powder with different granulation size. The aim is to describe the consolidation behavior of this powder using compaction curves and relative density after sintering. In this study the powder has been pressed by collector pressing method and sintering in conventional furnace.

INVESTIGATION OF THE TRANSPARENT CERAMIC OPTICAL PROPERTIES BASED ON ZRO2, PRODUCED BY SPARK PLASMA SINTERING

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Transparent ceramics based on cubic zirconia (ZrO_2) stabilized by 10 mol. % of yttrium oxide (Y_2O_3) produced by spark plasma sintering (SPS) at temperatures 1300-1400 oC for 10 min. Heating rate and pressure were varied. The obtained samples represented higher density, close to theoretical and high light transmittance in the infrared region. The effect of the sintering parameters on the optical properties of the ceramics was discussed.