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O.S.C.I.10.

**FEATURES OF THE NANOSTRUCTURED MATERIALS FOR NONLINEAR OPTICS
AND SOLAR ENERGY APPLICATIONS**

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The nonlinear refraction and third order susceptibility are discussed for different organic materials doped with fullerenes, shungites, carbon nanotubes, carbon nanofibers, quantum dots, etc. nanoobjects. The evidence of the correlation between laser induced change of the refractive index and charge carrier mobility are obtained. The features of new nanocomposites for their possible optoelectronics, laser techniques and solar energy applications are considered. The results have been supported by RFBR grant #10-03-00916.

O.S.C.I.11.

**PREPARATION OF METAL NANOPARTICLES FOR SOFC ANODES USING
SONOELECTROCHEMICAL METHODS**

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The aim of this research is the preparation of stable water suspensions of metallic nanoparticles, such as gold, silver and copper by an ultrasound assisted electrochemical process. The obtained metallic nanoparticles are going to be used to improve durability and efficiency of SOFC anode cermets against degradation phenomena arising from carbon and sulfur containing compounds in the feed. The particles are stabilized in order to prevent agglomeration. Formation and size of the nanoparticles are affected by parameters like current density, current pulse duration and ultrasonic pulse duration. The optimization of the size of the metal nanoparticles and of the efficiency of the sonoelectrochemical procedure was succeeded by varying these parameters both in galvanostatic as well as potentiostatic conditions. The obtained nanoparticles were characterized by DLS and TEM.