OPTICAL AND MORPHOLOGICAL CHARACTERIZATION OF ZnSe NANOPARTICLES PROCESSED BY LASER ABLATION IN LIQUID.

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In this work we present some results and analysis concerning the processing of semiconducting ZnSe nanoparticles obtained by laser ablation of diluted ZnSe powder in acetone. A Nd-YAG pulsed laser was used for ablation, tuned at the first harmonic, 1064 nm, 50 Hz frequency repetition during 60 minutes. The experiment was performed at different power intensities. UV-Vis, photoluminescence and Raman spectroscopies were used to characterize the ZnSe particles, whereas scanning electron microscopy was used to determine the morphology and size of the particles. According to the UV-Vis results it was confirmed a shift of the band edge towards high energy (blue shift) from 2.75 to 3 eV in the sample processed at lower laser power intensity. Concerning PL it was observed an increase of the PL intensity probably due to the size reduction of the particles. The PL spectra show one main band located at 2.8 eV. Raman spectroscopy show the LO phonon at 250 cm\textsuperscript{-1} and also the so called surface mode at 230 cm\textsuperscript{-1}, for the case of the smaller particles, approximately 20 nm, which was estimated through SEM pictures. A deep analysis of the results is presented and discussed.

\textbf{Keywords:} liquid laser ablation, ZnSe nanoparticles, raman spectroscopy

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