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Structure-property relationship of sol-gel synthesised zinc-oxide nanoparticles

Wednesday, 13 July 2011 17:00 (2 hours)

<p>Zinc-oxide nanoparticles are well known for their novel optical and electronic properties for applications in various fields such as solar cells, ultra violet shielding, gas sensors, paint and heat mirrors. We report on the relation between the structure and optical properties of ZnO nanoparticles synthesized via the sol-gel technique, with specific emphasis on the effect of growth and reaction temperatures. High-resolution microscopy techniques, complemented by Raman spectroscopy and x-ray diffraction, confirm that the crystallinity and particle size of ZnO nanoparticles is directly related to the synthesis conditions. Optical absorption and emission spectroscopy show that optical band gap and photoluminescence of the ZnO nanoparticles are intimately related to its structural properties, ascribed to the quantum confinement effect. Photoluminescence spectroscopy confirm the emission peaks in the ultraviolet (380 nm) and visible (500 nm) region; the latter attributed to the presence of the singly ionized oxygen vacancies in the nanoparticle.

Level (Hons, MSc,
   PhD, other)?

MSc

Consider for a student
   award (Yes / No)?

Yes

Would you like to <br> submit a short paper <br> for the Conference
 Proceedings (Yes / No)?

Yes

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