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Synthesis and characterization of MnS nanoparticles using the chemical bath deposition method

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Abstract content
   (Max 300 words)

Manganese sulfide (MnS) nanoparticles were synthesized by the chemical bath deposition (CBD) method using the mixed aqueous solutions of manganese acetate, thiourea and an ammonium solution. The pH, using ammonia (NH3), was varied in the deposition process to determine the effect thereof and the synthesizing time was constant at 10 minutes. The temperature of the bath was maintained at 80˚C. The final yields were characterized for structural, morphology and optical properties. The X-ray diffraction (XRD) spectra of the MnS nanoparticles shift from cubic to the single hexagonal phase MnS. The particle size was found to be dependent on the pH. The average particle sizes calculated using the XRD spectra were found to be 14, 10, and 22 nm for a pH of 7.73, 8.74 and 9.01 respectively. Scanning electron microscopy (SEM) micrographs depict irregular nanoparticles at low pH and flakes-like nanoparticles structures at a higher pH. For a high pH of ammonia the particles are non-agglomerated. Fourier transformed infrared (FTIR) spectroscopy analyses confirmed these manganese sulfides. Photoluminescence (PL) spectra indicated that the nanoparticles product had emission peaks at 364, 381, 415 and 452 nm. The manganese sulphide which was obtained with a pH of 8.74 has the highest luminescence intensity and the one obtained with a pH of 9.01 has the broadest peak.

Apply to be
 consider for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD)?

PhD

Main supervisor (name and email)
and his / her institution

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Would you like to <br> submit a short paper <br> for the Conference
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Yes

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