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Synthesis of AgInS2–ZnS at Low Temperature with Tunable Photoluminescence for Photovoltaic Applications

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Abstract : The I–III–VI2 semiconductor Nanocrystals such as AgInS2 have great interest for various applications such as optical devices (solar cell and LED), cellular Imaging and bio tagging etc. we synthesized the phase and shape controlled chalcopyrite AgInS2 (AIS) colloidal nanoparticles by thermal decomposition of metal xanthate at low temperature in an organic solvent's containing surfactant molecules. Here we are focusing on enhancements of photoluminescence of AgInS2 Nps by coating of ZnS at low temperature for application of optical devices. The size of core shell Nps was less than 50nm.by increasing the time and temperature the emission of the wavelength of the Zn coated AgInS2 Nps could be adjusted from visible region to IR the QY of the AgInS2 Nps could be increased by coating of ZnS from 20 to 80% which was reasonably good as compared to those of the previously reported. The synthesized NPs were characterized by PL, UV, XRD and TEM.

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