

SnS nanoparticle synthesis: Effects of thermal annealing on optoelectronic and morphological properties

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SnS nanoparticles were synthesized, and the effects of thermal annealing on the optoelectronic and morphological properties were examined. As-synthesized SnS NPSs with a mean size of 3–4 nm undergo a solid state morphological transformation by high temperature annealing in a nitrogen environment. Upon annealing, the size of SnS NSP was increased to 5–6 nm with enhanced crystallinity. The PL emission intensity of the nitrogen-annealed samples was slight decreased with the red-shift to a longer wavelength. The power conversion efficiency of the solar cells using polymer and the SnS NSPs was found to be ~0.71%. All results confirm that the SnS NCs possess all the requirements to be as inorganic layer in photovoltaic devices.