

Synthesis and Characterization of CIGS nano-particles by Wet Process

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In this study, CIGS nanoparticles were synthesized by colloidal route. Cupric chloride (CuCl₂), Indium trichloride (InCl₃), Gallium trichloride (GaCl₃) were dissolved in ethyl alcohol (C₂H₅OH), and Selenium (Se) was dissolved in ethylenediamine (C₂H₈N₂) respectively. As-synthesized nanoparticles were washed with methyl alcohol to remove impurities and dried to obtain pure CIGS nanoparticles in a vacuum oven. As-synthesized CIGS nanoparticles were dispersed in Isobutyl alcohol (C₄H₉OH) to obtain a nanoparticles ink. Deposited thin films annealing temperature were up to 550 °C at N₂ atmosphere for 2 hrs. The properties of CIGS nanoparticles ink were investigated by SEM, XRD, TEM and PL. We found that the growth temperature and Cu/(In + Ga) ratio are important factors in controlling the nanoparticles.

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