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Fabrication of inorganic quantum dots (QDs) sensitizer absorbers thermalized from lead dithiocarbamates single-source precursors complexes

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Solar cell sensitizer absorbers of inorganic quantum dots (QDs) has shown great potential in photovoltaic application. The use of quantum dots as an improved absorber layer in photochemical solar cells has attained a noble ground, where essential electron and hole generation occurs. Herein, we demonstrate the synthesis and characterization of metal sulphides nanoparticles, prepared from dithiocarbamates complexes of Pb(II) using single-source precursors technique. PbS QDs nanocrystals were measured by SEM/EDS, HRTEM, UV-Vis, PL, FTIR and Raman. Thermal studies through TGA performed in a range temperatures of (30 to 900°C). The result of HRTEM analysis revealed crystallite sizes ranges of 1.82 – 5.95. Raman spectra showed the presence of Raman active modes, while PL analysis has affirmed the presence of emissions peaks around 460 nm. Their peak of emission frequencies is very sensitive to size, shape and composition to match the solar spectrum of colours of light they absorb. This outcome features the successful preparation of single-source precursors of PbS nanoparticles.

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

Yes

Level for award (Hons, MSc, PhD, N/A)?

PhD

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