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Optical sensitivity of CdS-Au nanocomposites prepared by physical techniques: pulsed laser deposition and sputter coating.

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In this work we seek to understand the role played by the shape and size of co-catalyst nanoclusters on the semiconductor surface optical properties. The preparation of nanocomposites is of high importance in science and engineering. These are usually prepared with chemical methods and in this work we also try to counter the role played by solvents in the preparation of these structures. This is done by using two physical techniques: pulsed laser deposition (PLD), which is famous for not altering the stoichiometry of materials and sputter coating (SPC). The optical sensitivity of semiconductor material is enhanced by combining them with metal components.

The new material performs much better than the individual components. The presence of the nanoclusters on the CdS surface attests itself by the enhancement in the absorption intensity of the NCs. The ultraviolet-visible (UV-Vis) spectrum of the SPC nanoclusters showed the highest increase, just as photoluminescence (PL) quenching was observed to be the highest for these agglomerated nanoclusters. This shows the creation of a Schottky junction which allows for the transfer of more electrons from the semiconductor conduction band to the metal valence band of the SPC NCs.

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

Yes

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

MSc

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