

Synthesis of PbS/CuS quantum dots by low temperature process and their applications to solar cells

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In this work, we synthesized PbS/CuS core/shell type quantum dots by changing the amount of Cu ion in various sizes of PbS QDs using a low temperature process. As the CuS is formed, the band edge absorption of PbS decreases, and a large absorption is obtained in the NIR wavelength due to the surface plasmon effect (SPR). PbS/CuS QDs with these unique optical properties and structures were applied to solar cells. Using this, we obtained a PCE of 9.32% by optimizing the cell characteristics.