

Synthesis of Platinum-Decorated Cadmium Chalcogenide Hybrid Nanomaterials for Photocatalytic Water Splitting

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Colloidal hybrid nanomaterials are of great interest due to their synergistic properties from different compositions along with unique self-assembly behavior with various applications such as photocatalysts, bioimaging materials, and so forth. Here, we report the synthesis of metal-semiconductor hybrid nanomaterials, specifically platinum-tipped & decorated cadmium chalcogenide nanocrystals with different morphologies, such as nanorods or tetrapods. Depending on the surface condition of semiconductor nanocrystals, metals nucleate and grow from either ends of semiconductor nanocrystals or all around the nanocrystal surface. This gives us opportunities to control the number of reaction sites of metal-semiconductor hybrid nanomaterials as photocatalysts for photocatalytic water splitting reaction, where the semiconductor region act as light harvesting sites while the platinum tips acting as hydrogen evolution reaction sites.