Low Temperature Synthesis of Monodisperse, Highly Quantized CdX Nanoparticles and Subsequent Fabrication of Thin Film Photoanodes Via Electrophoretic Deposition

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Abstract: A low temperature, ambient atmosphere synthetic method for the fabrication of quantized, monodisperse cadmium chalogenide nanoparticles with high zeta potentials has been developed. These particles can be used to obtain uniform, transparent thin films by electrophoretic deposition, which may be utilized for photo-catalyzed hydrogen evolution from water. Subsequent addition of a second layer of an oxygen-evolving catalyst may provide a pathway for the prevention of hole-induced decomposition of the CdX layer and allow for sustainable water splitting without the use of sacrificial additives or external biases.