

(Research Article 4)

“Controlled Synthesis of CdS Nanoflowers Thin Films for H₂ Electro-Generation”.

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Abstract:

Developing of thin film technologies is promising to enhance the efficiency and the stability of photocatalyst materials for hydrogen production, owing to their low cost production for large-scale photocatalytic applications, large surface areas for light harvesting and good electronic properties for charge transfer. Herein, cadmium sulfide (CdS) films supported on ITO glass have prepared by using chemical bath deposition (CBD) technique at different times (3 to 12 h) at 60 °C, then annealed up to 300 °C for 2 h. When developed as photoanode for water splitting, ITO/CdS/Au electrode successfully achieve high current density J_{ph} , (0.54 mA.cm⁻²), IPCE efficiency(2.34 %) and ABPE efficiency (0.42 %) compared with ITO/CdS electrode (0.22 mA.cm⁻², 1.35 % and 0.10%), respectively. Moreover, the stability of the current density for the prepared films has been prolonged up to 2000 s. The improvement in PEC behavior for the prepared electrodes could be attributed to (i) control the growth mechanism of the prepared CdS thin films which can enhance the light harvesting, (ii) the existence of the Au layer which can facilitate the electron transport. The obtained results endow the prepared CdS ITO/CdS/Au electrode a promising strategy for hydrogen evaluation.
