

***Supporting information***

**Molecular Cobalt-Salen Complexes as Novel Cocatalysts for Highly  
Efficient Photocatalytic Hydrogen Production over CdS Nanorods  
Photosensitizer under Visible Light**

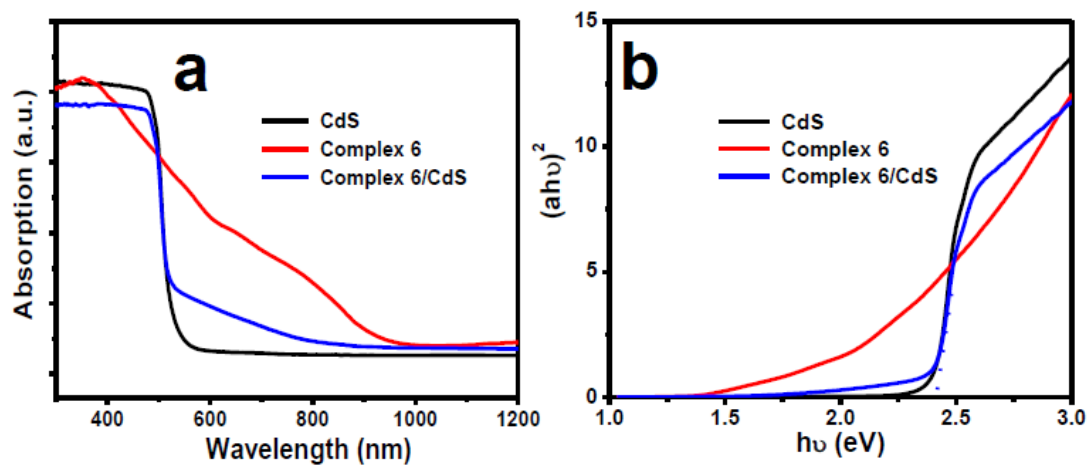
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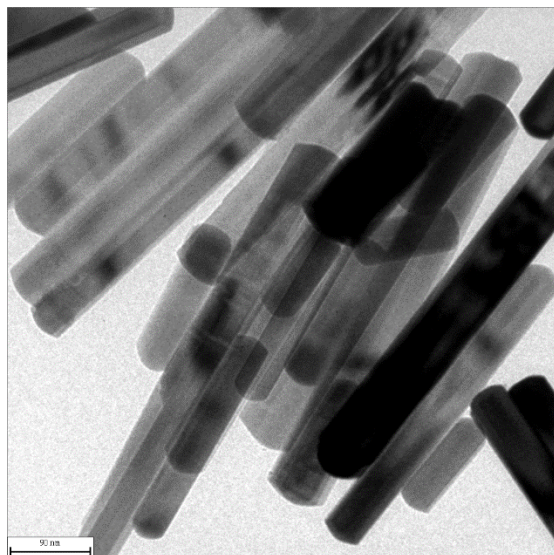
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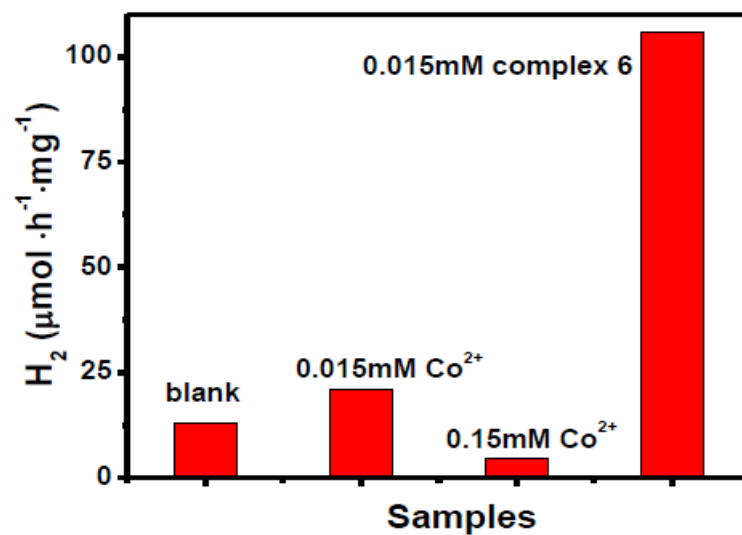
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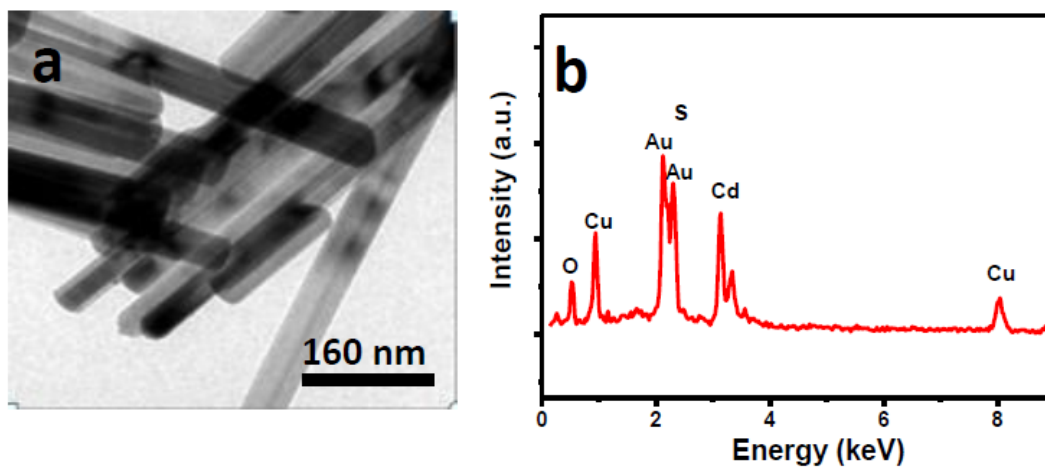
**Figure S1.** (a) UV-vis diffuse reflectance spectra of the prepared pure CdS NRs (black line), complex 6 (red line) and complex 6/CdS NRs mixture (blue line). (b) The estimated band gap spectra obtained from (a).



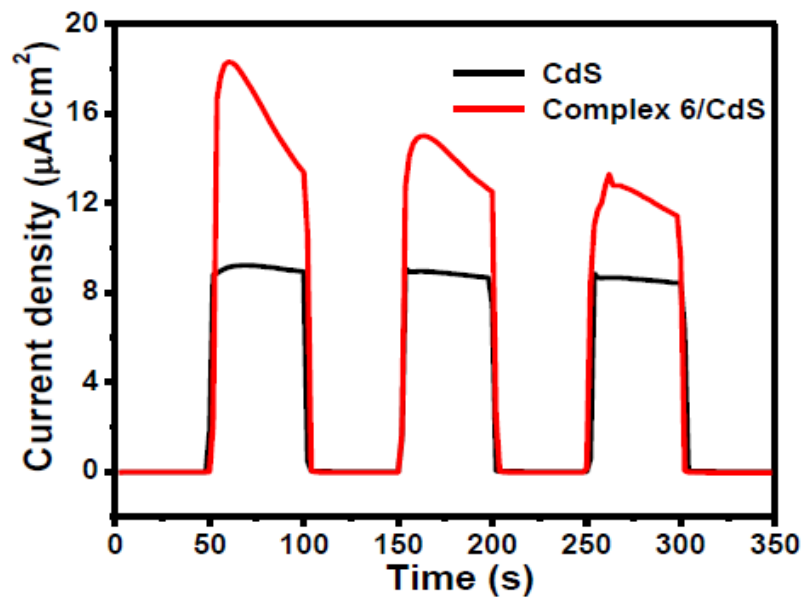
**Figure S2.** TEM image of complex **6**/CdS NRs (1.4 wt % of cobalt in the composite).



**Figure S3.** Comparison of hydrogen evolution rates of Co<sup>2+</sup> and complex 6 under visible light. The reaction system contains 1.0 mg CdS NRs, 0.25 M Na<sub>2</sub>S, 0.35 M Na<sub>2</sub>SO<sub>3</sub>, 20 mL Millipore water, and 0.015 mM Co<sup>2+</sup>, 0.15 mM Co<sup>2+</sup>, 0.015 mM complex 6 respectively.



**Figure S4.** TEM image (a) and EDX spectrum (b) of photocatalyst centrifuged by water and acetonitrile respectively after 10 hour irradiation under visible light ( $\lambda > 420$  nm).



**Figure S5.** Photocurrent density responses of as-prepared pure CdS NRs (black line) and complex 6/CdS NRs mixture (red line). The experiment was performed in a 0.5 M  $\text{Na}_2\text{SO}_4$  solution under chopped irradiation. The applied potential of bulk electrolysis was 0 V versus Ag/AgCl electrode.