Supporting Information

Optimization of the experimental conditions of hydrogen production by the Pt(CdS/ZnS) system under visible light illumination

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Calculation of band gap energy

The band gap energy (Eg) was calculated from the absorption data by using the Tauc relation:

$$\alpha h\nu = A(h\nu - E_g)^m$$

where α is the absorbance, hν is the photon energy, Eg is the estimated band gap energy, and A is a constant. The value of m may be 2, a characteristic value for an indirect allowed transition, or 1/2, a characteristic value for a direct allowed transition. The latter is more consistent with the band gap values reported in the literature. Hence, by plotting $(\alpha h\nu)^2$ versus hν, when the absorbance is zero, i.e., for the zero value of the y-axis, $h\nu=E_g$. Thus, E_g can be obtained by finding the intercept of the tangent of the plot to the X axis.

References

J. Tauc, A. Menth, J. Non-Cryst. Solids 8 (1972) 569-585.

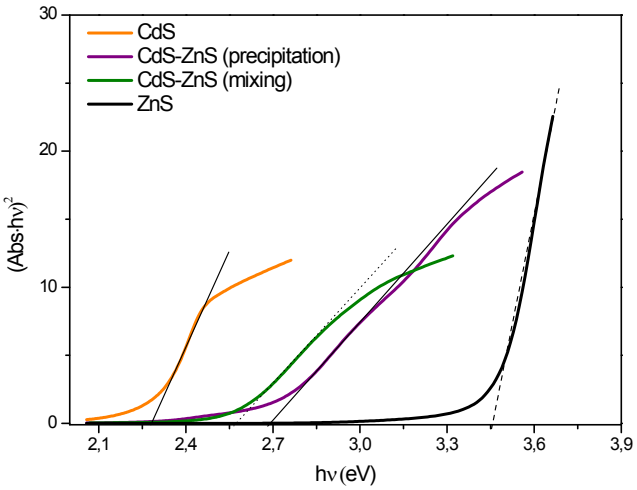

Fig. S1. Plot of (absorbance·energy)^2 against energy obtained from DRS UV-Vis spectra.

BET adsorption/desorption isotherms

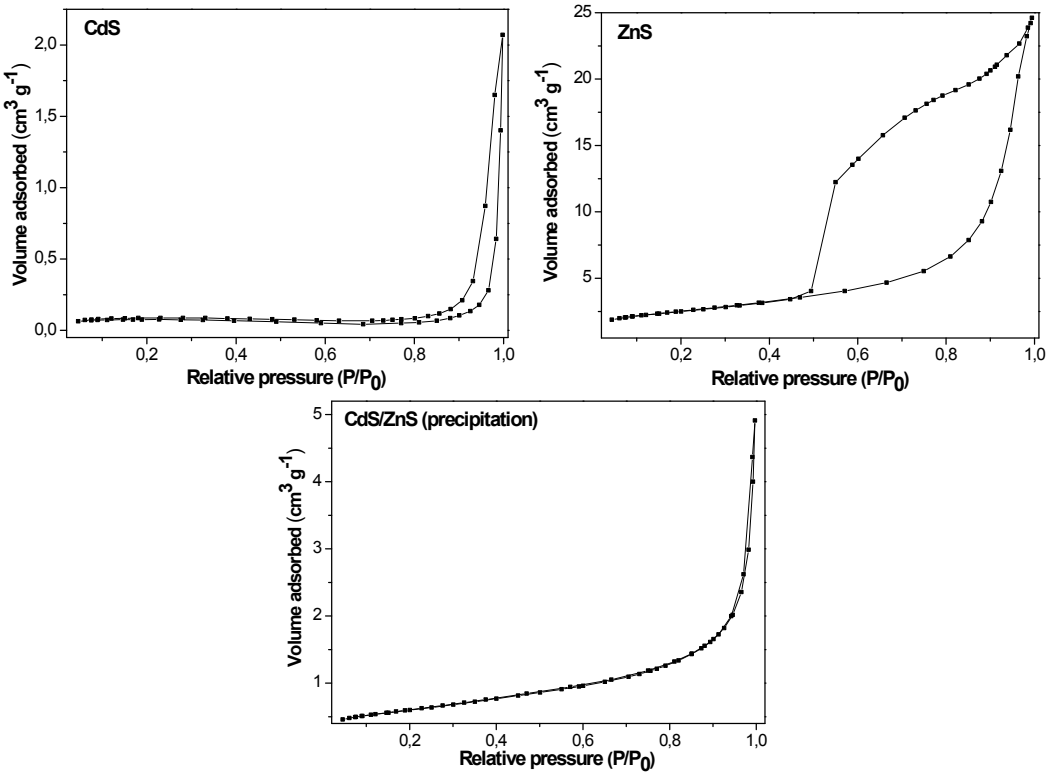

Fig. S2. N_2 adsorption/desorption isotherms for CdS, ZnS and CdS/ZnS (precipitation) samples.

X-ray diffractograms of CdS/ZnS (precipitation)

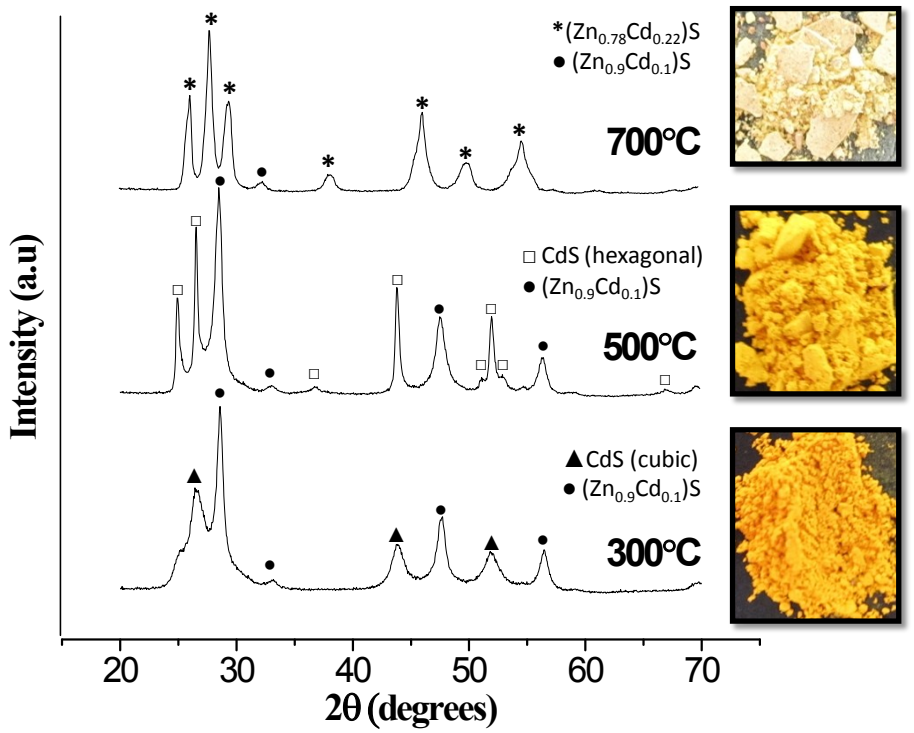

Fig. S3. X-ray powder diffractogram of CdS/ZnS (precipitation) composite and the corresponding pictures at different temperatures of calcination.