

SUPPLEMENTARY INFORMATION

Visible light-driven CO₂ reduction by enzyme coupled CdS nanocrystals[#]

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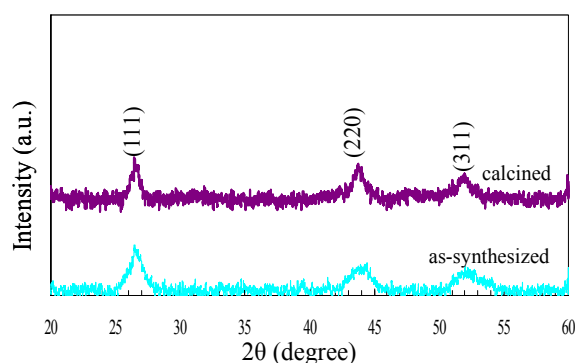


Figure S1. The XRD patterns of as-synthesised CdS QDs and calcined CdS

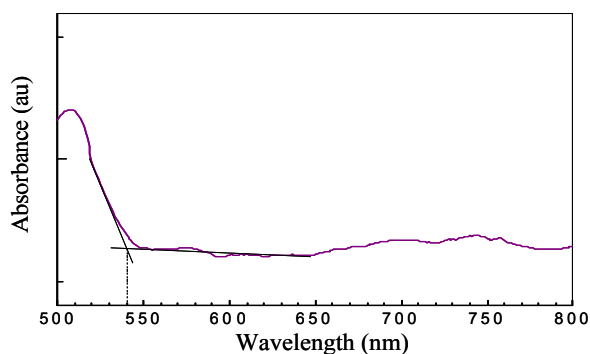


Figure S2. UV-vis absorption spectrum for CdS QDs

Determination of the amount of CODH attached to CdS nanocrystals:

To determine the amount of co-attached CODH, 10 mg of CdS nanocrystals was dispersed in 5 ml of 0.35 M MES buffer solution (pH 6) in a pressure vessel, and sonicated for 20 min to ensure the formation of a stable suspension. Then, 13.9 µl of 184 µM CODH I (2.56 nmol) was introduced into the CdS nanocrystals suspension, followed by gentle stirring for 20 min to allow co-attachment. The CODH-CdS nanocrystals suspension was then subjected to ultra-centrifugation. The resulting supernatant was filtered through a membrane filter to assist the removal of any remaining traces of CdS. The supernatant solutions for each sample were subjected to UV-vis spectroscopy, and these spectra were compared to that of a control enzyme solution which had not been exposed to nanocrystals but had otherwise been through an identical procedure. The amount of co-attached CODH was determined from the difference in absorbance at 280 nm.

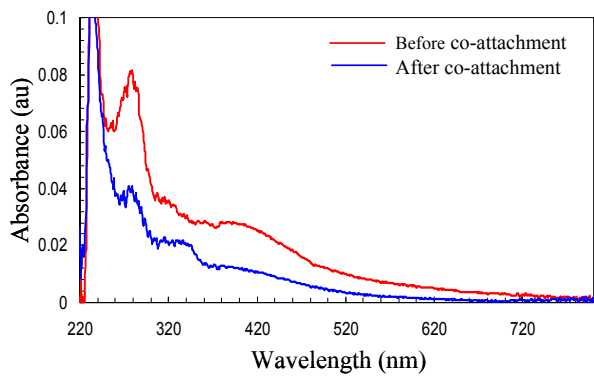


Figure S3. Representative UV-vis absorbance spectra for solutions of CODH I in MES buffer (0.51 μ M CODH I, 0.35 M MES, pH 6) before and after co-attachment of CODH I with CdS QDs

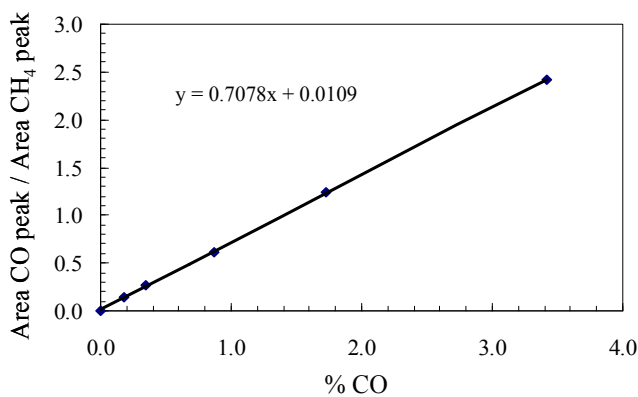


Figure S4. Calibration plot for GC quantification of CO against an internal CH₄ standard.

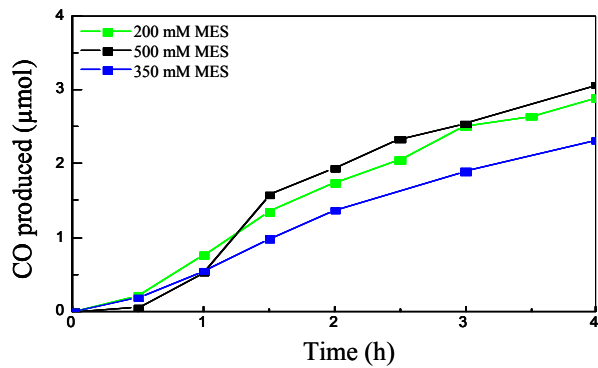


Figure S5. The amount of CO produced versus time for CODH-QD assemblies with different concentrations of MES (pH 6, 20 °C)