

Supporting information for

Mercaptophosphonic acids as efficient linkers in quantum dot sensitized solar cells

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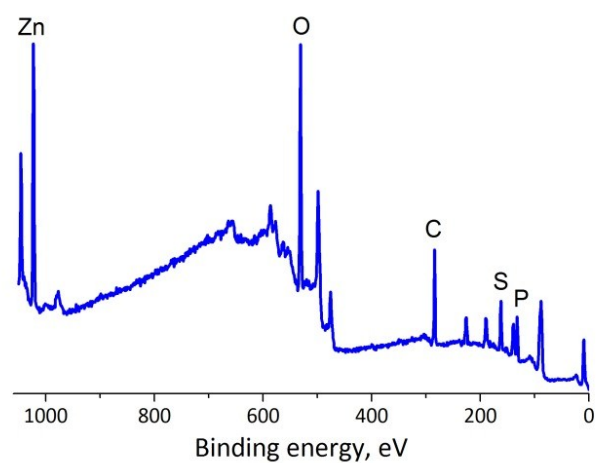


Figure S1. XP survey spectrum of ZnO/MEPA assembly

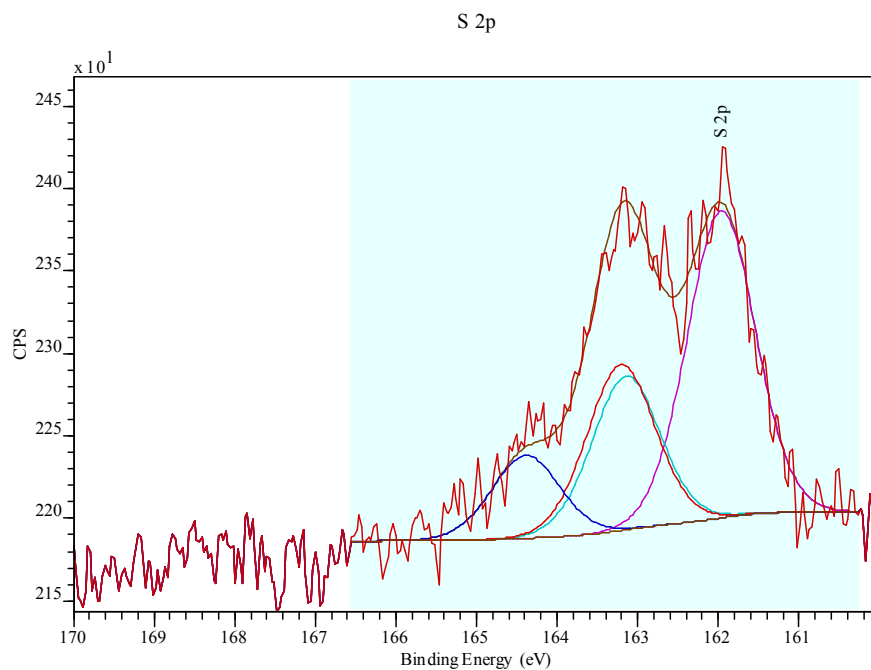


Figure S2. High resolution XP spectrum of S 2p region of MEPA assembled on gold.

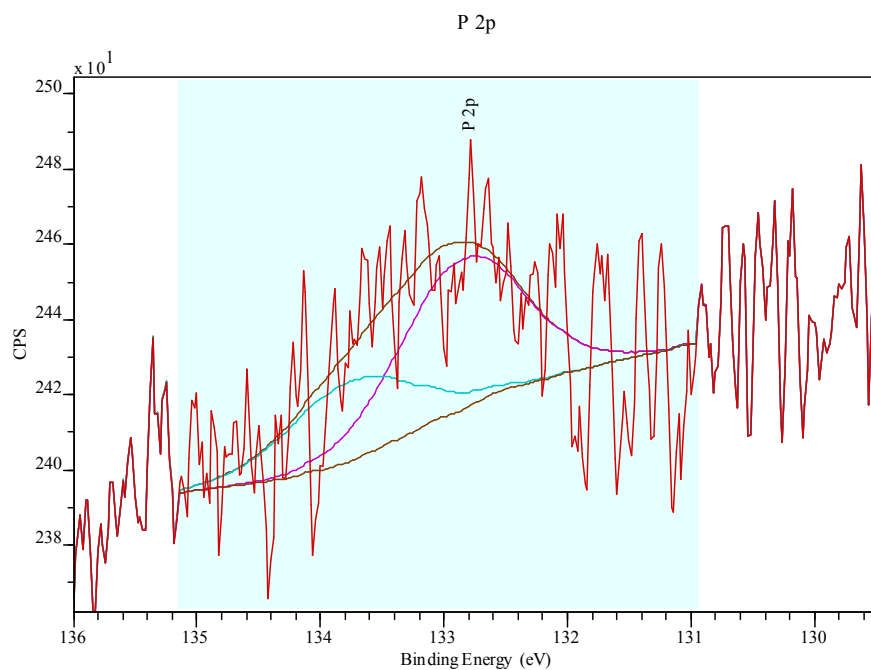


Figure S3. High resolution XP spectrum of P 2p region of MEPA assembled on gold.

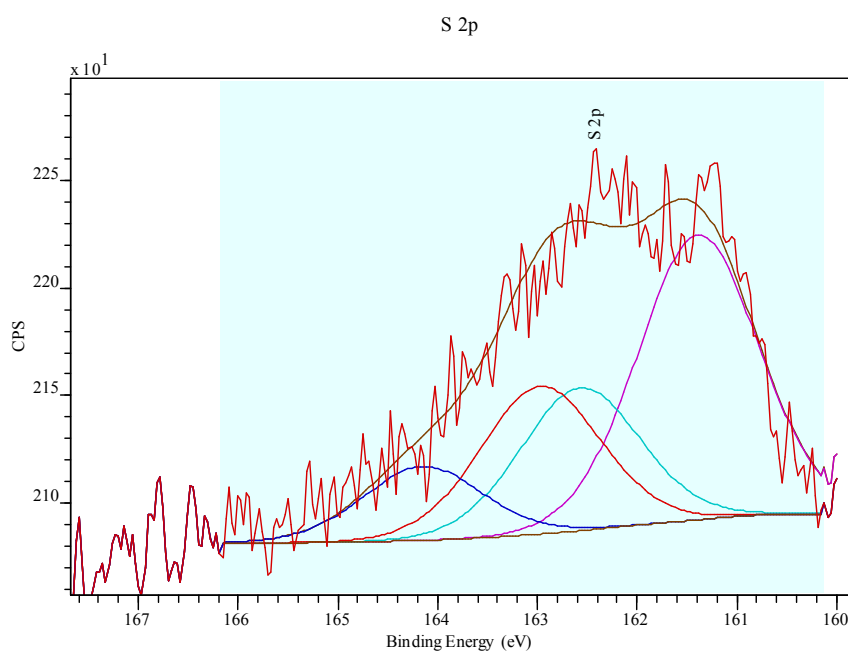


Figure S4. High resolution XP spectrum of S 2p region of MUPA assembled on gold.

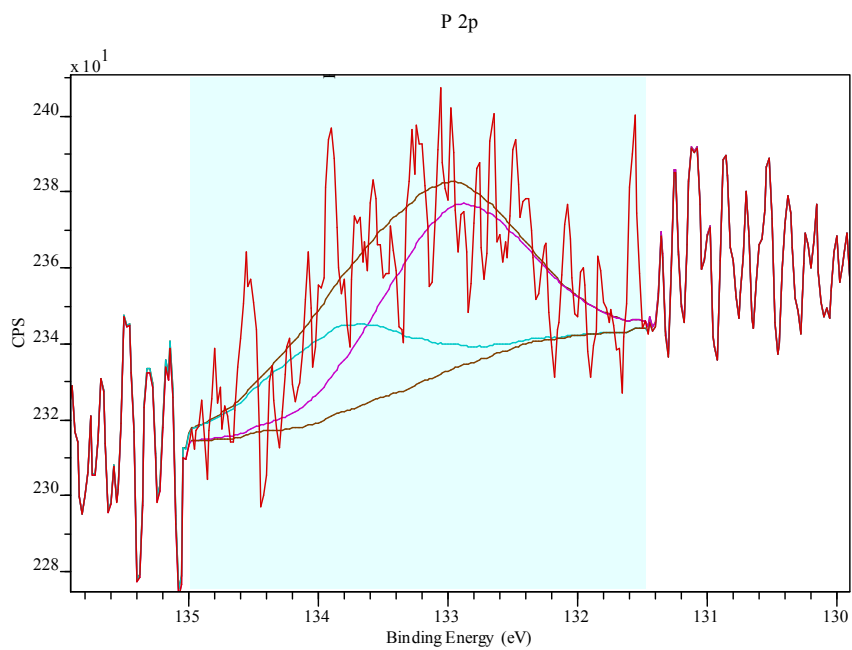


Figure S5. High resolution XPS spectrum of P 2p region of MUPA assembled on gold.

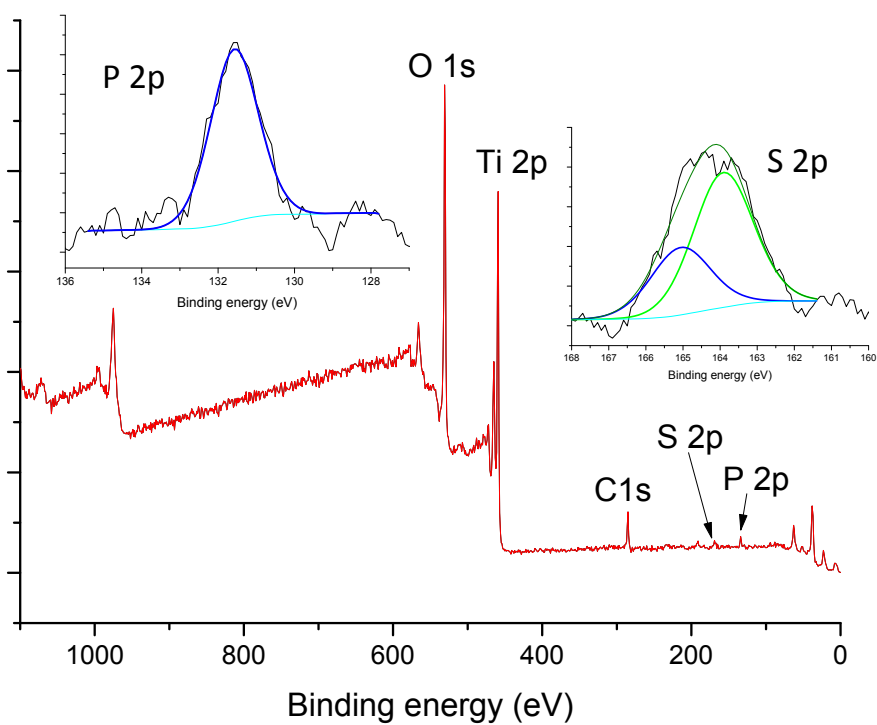


Figure S6. Survey XPS spectrum of TiO_2/MEPA and high resolution regions of P 2p and S 2p (insets).

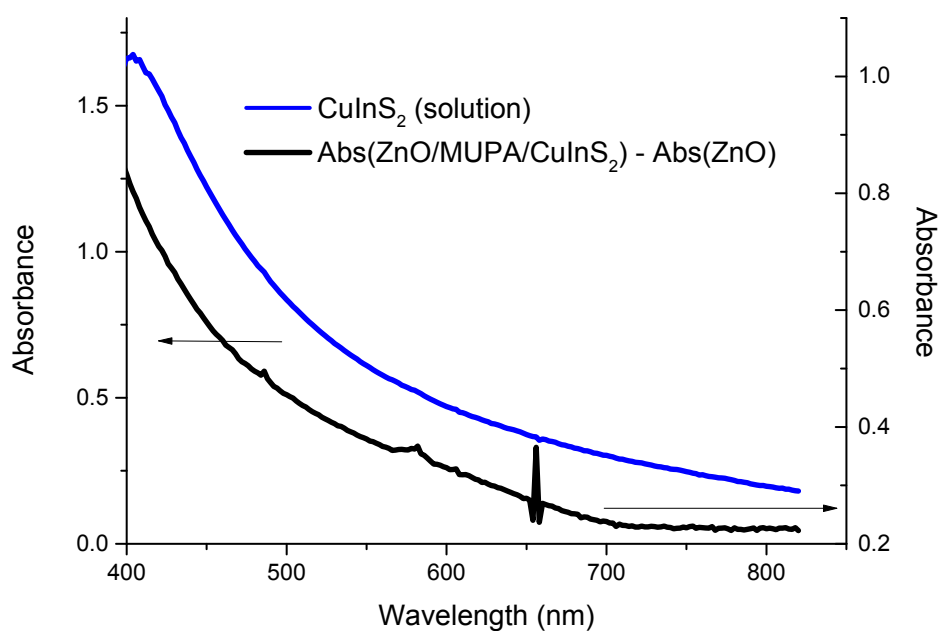


Figure S7. Absorption spectrum of the CuInS₂ QD solution in chloroform (blue), and spectral difference between QD sensitized ZnO nanowires with MUPA and ZnO nanowires (black).

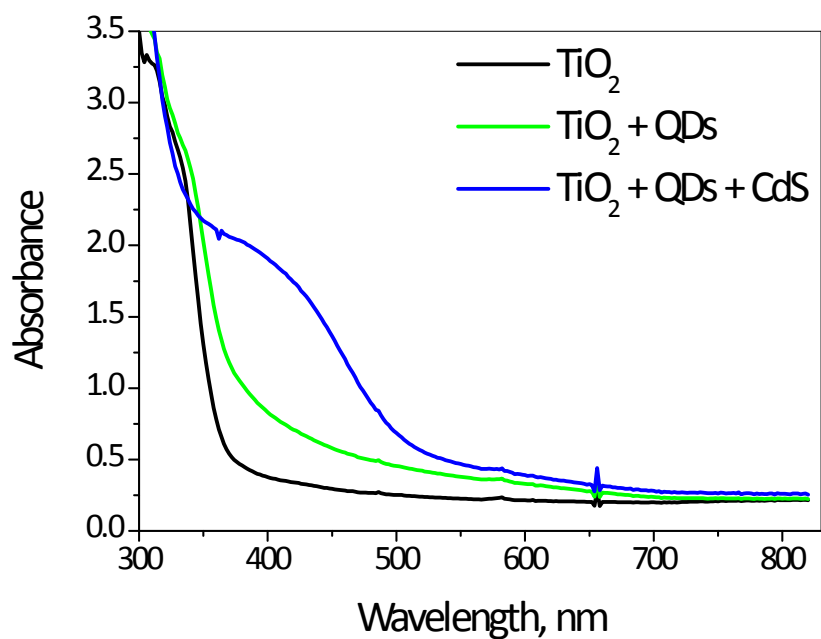


Figure S8. Effect of CdS passivation layer coating on the absorption spectrum of sensitized TiO₂ substrates.

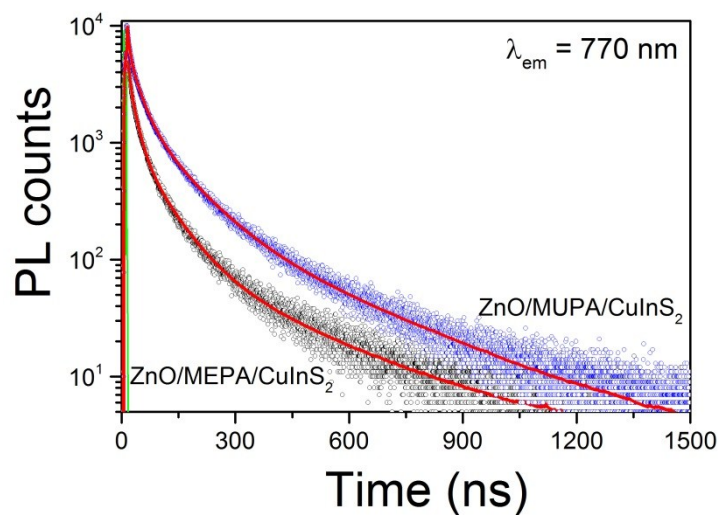


Figure S9. PL kinetics of CuInS₂ deposited on ZnO nanowires with different linkers: MEPA (black) and MUPA (blue) as function of time.

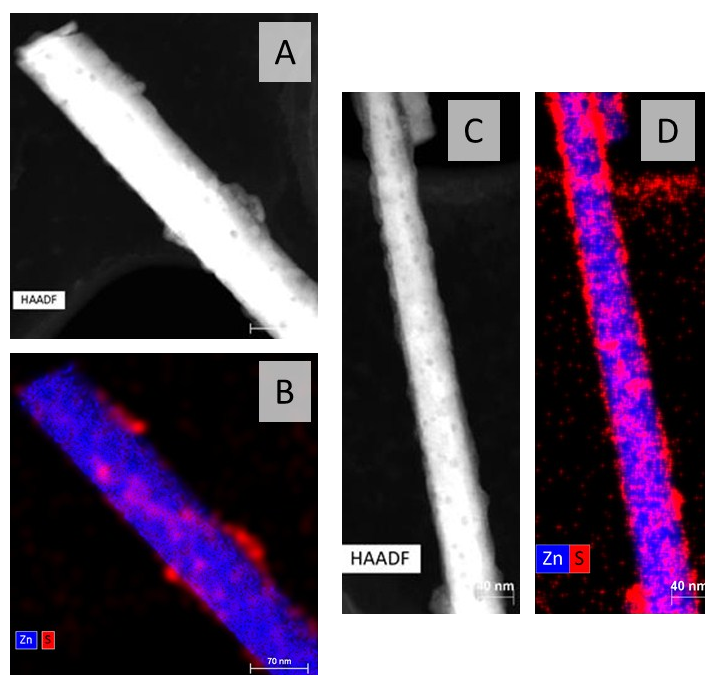
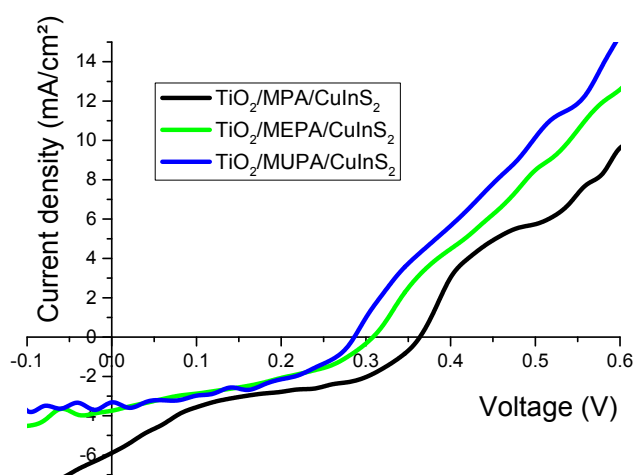


Figure S10. HAADF (A, C) and EDX (B, D) mapping images of CuInS₂ deposited on ZnO nanowires with (A, B) or without (C, D) MEPA linker. Chemical imaging shows Zn and sulfur rich zones in blue and red, respectively.

Table S1. Exponential fit parameters of the PL decay of the assemblies studied

Sample	α_1	τ_1 , ns	α_2	τ_2 , ns	α_3	τ_3 , ns	τ_3 , ns
SiO ₂ /CuInS ₂	0.51	93	0.24	13	0.25	486	172
TiO ₂ / CuInS ₂	0.28	2	0.52	12	0.2	15	17
TiO ₂ /MPA/CuInS ₂	0.29	1.4	0.5	10	0.21	44	15
TiO ₂ /MEPA/CuInS ₂	0.24	4	0.49	26	0.26	113	43
TiO ₂ /MUPA/CuInS ₂	0.2	5	0.47	36	0.33	169	74
ZnO/MEPA/CuInS ₂	0.25	3	0.55	5	0.2	267	58
ZnO/MEPA/CuInS ₂	0.19	10	0.50	59	0.31	248	108

**Figure S11.** Representative current density—voltage curves of solar cells based on TiO₂ sensitized by CuInS₂ with MPA (black), MEPA (green) and MUPA (blue) linkers.