

Electronic supplementary information

Application of a Ni mercaptopyrimidine MOF as a highly efficient catalyst for sunlight-driven hydrogen generation

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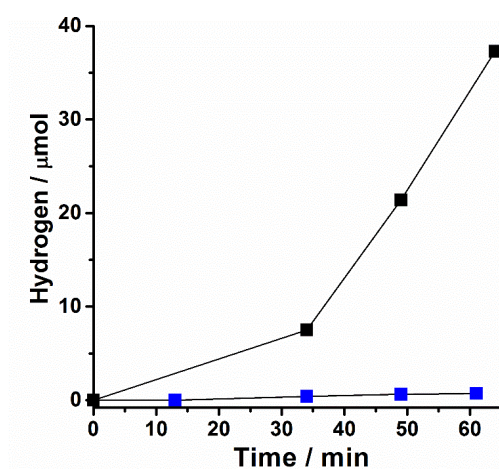


Figure S1. The amount of hydrogen photogenerated in the presence of $[\text{Ni}_2(\text{PymS})_4]_n$ (15 μmol), FI (2 mM) and TEA (15%) in water at pH = 10 (black); (b) the amount of hydrogen photogenerated by the filtrate of the aqueous solution containing $[\text{Ni}_2(\text{PymS})_4]_n$ (15 μmol), TEA (15%) and FI (2 mM) after stirring for 5 minutes.

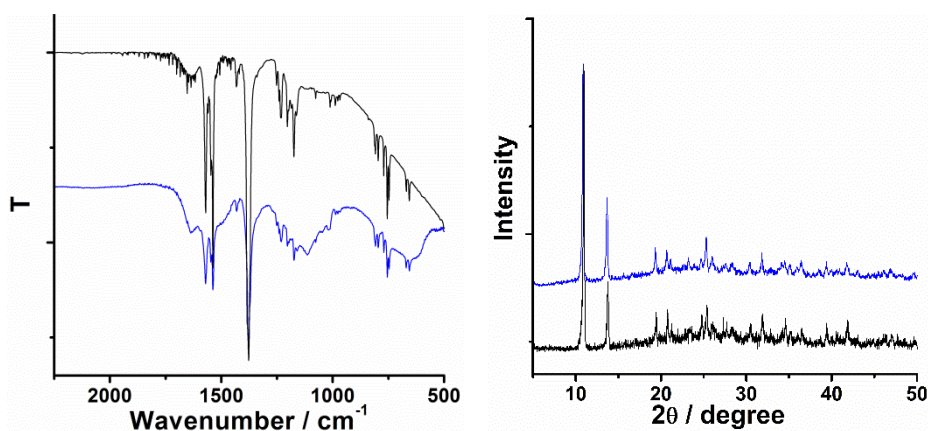


Figure S2. FT-IR spectra (left) and powder PXRD patterns (right) of $[\text{Ni}_2(\text{PymS})_4]_n$ before (black line) and after photocatalytic reactions (blue).

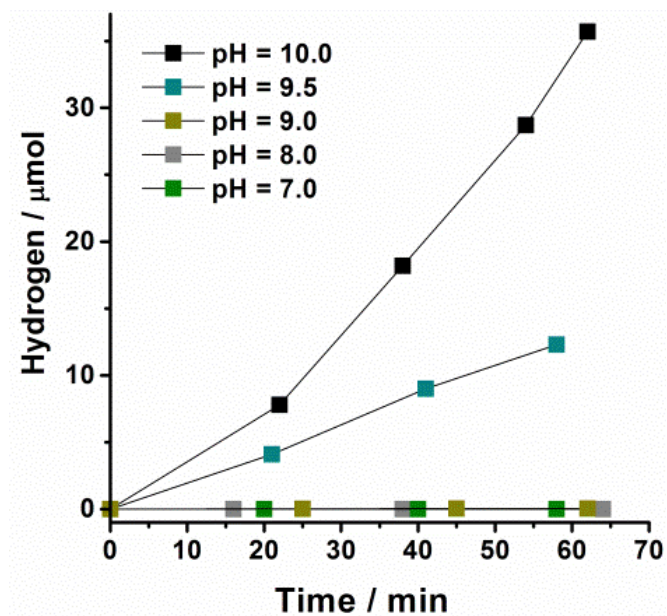


Figure S3. The amount of hydrogen photogenerated by $[\text{Ni}_2(\text{PymS})_4]_n$ ($10 \mu\text{mol}$) with FI (2 mM) and TEA (15% , v/v) in water with varied pH values from 7 to 10.

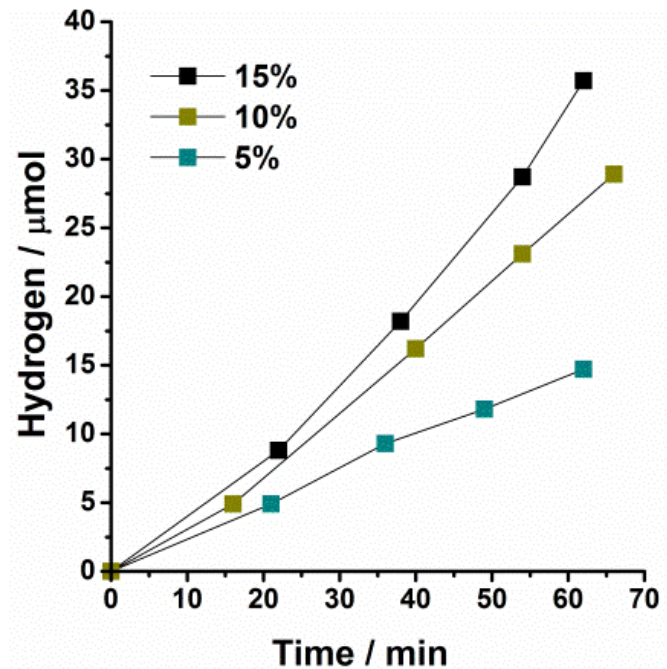


Figure S4. The amount of hydrogen photogenerated by $[\text{Ni}_2(\text{PymS})_4]_n$ ($10 \mu\text{mol}$) with FI (2 mM) in water when TEA changes from 5% to 15% (v/v).

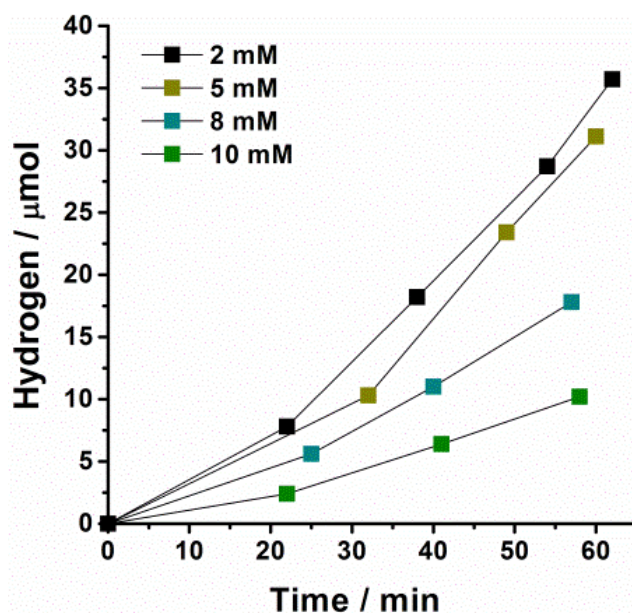


Figure S5. The amount of hydrogen photogenerated by $[\text{Ni}_2(\text{PymS})_4]_n$ ($10 \mu\text{mol}$) with TEA (15%) in water when FI changes from 2 to 10 mM at pH = 10.

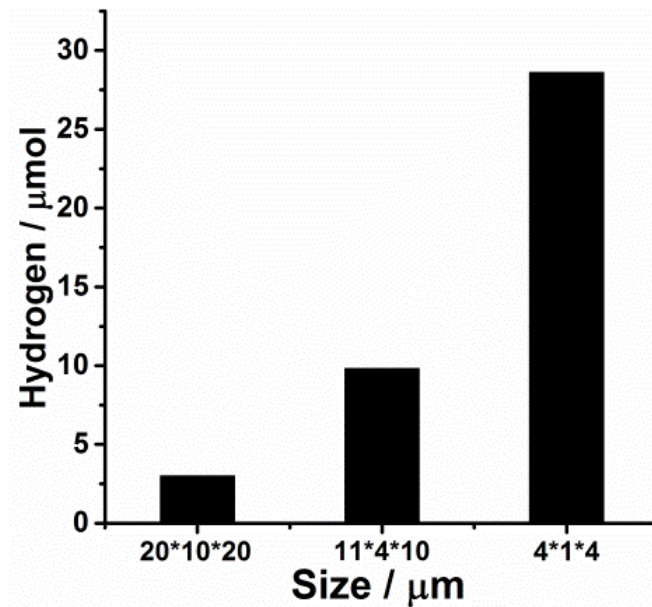


Figure S6. The amount of hydrogen photogenerated by $[\text{Ni}_2(\text{PymS})_4]_n$ ($5 \mu\text{mol}$) with different particle sizes: (a) $20 \times 10 \times 20 \mu\text{m}$; (b) $11 \times 4 \times 10 \mu\text{m}$; (c) $4 \times 1 \times 4 \mu\text{m}$ in the presence of FI (2 mM) and TEA (15%) in an hour.

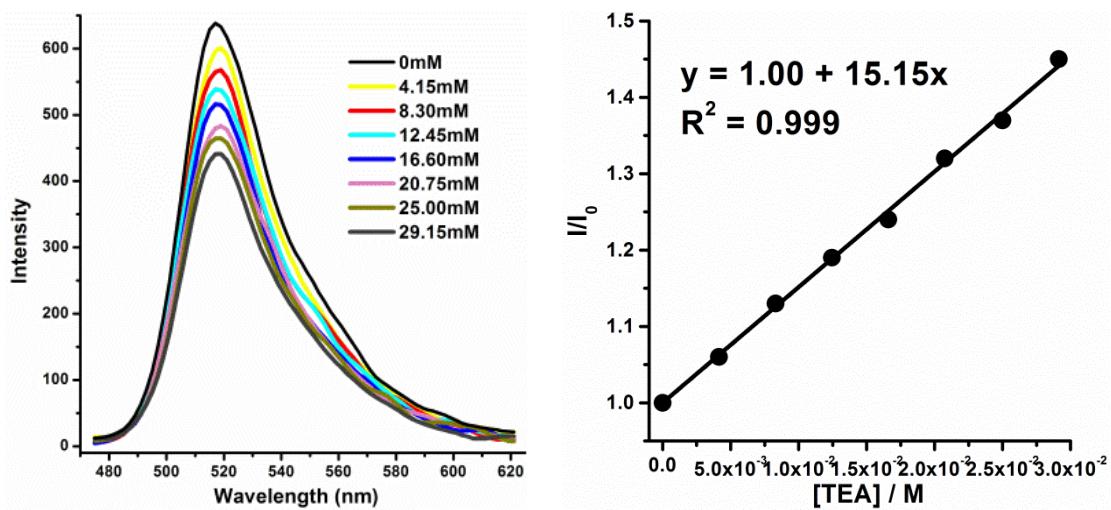


Figure S7. Emission quenching (left) and Stern-Volmer plot (right) of FI (0.01 mM) by TEA in water at pH = 10.

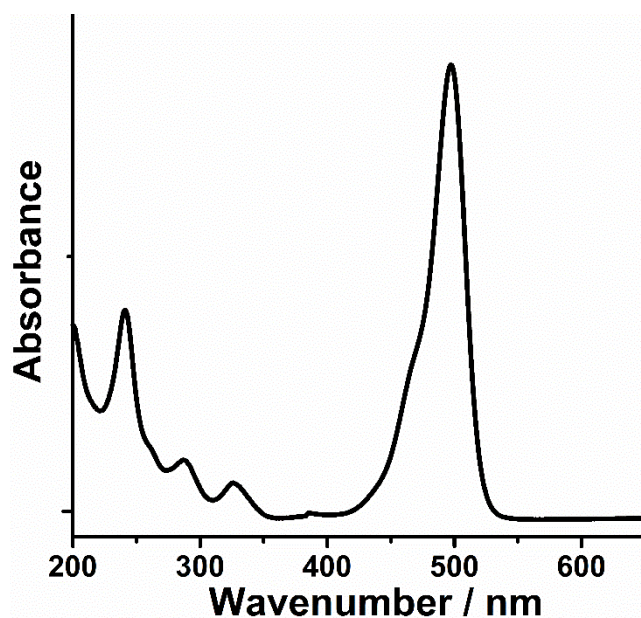


Figure S8. UV-vis spectrum of FI (0.002 mM) in aqueous NaOH solution (pH = 10).

Table S1 TON of the catalyst in different cycles

	Cycle 1	Cycle 2	Cycle 3	Cycle 4
TO		2.5	2.2	2.0
N	2.5			

All data was calculated from the photocatalytic experiments in the presence of $[\text{Ni}_2(\text{PymS})_4]_n$ (15 μmol) Fl (2 mM) and TEA (15%, v/v) at pH = 10.

Table S2 TOF of different amounts of catalyst for hydrogen production

$m_{\text{cat}} / \text{mg}$	1.4	2.1	2.8	5.6	8.4	11.
						2
TOF / h ⁻¹	10.6	9.0	6.5	3.5	2.5	1.7

All data was calculated from the photocatalytic experiments in the presence of Fl (2 mM) and TEA (15%, v/v) at pH = 10.