

## SUPPORTING INFORMATION

### **A dye-based metal-organic framework for efficient photocatalytic hydrogen production from aqueous solution**

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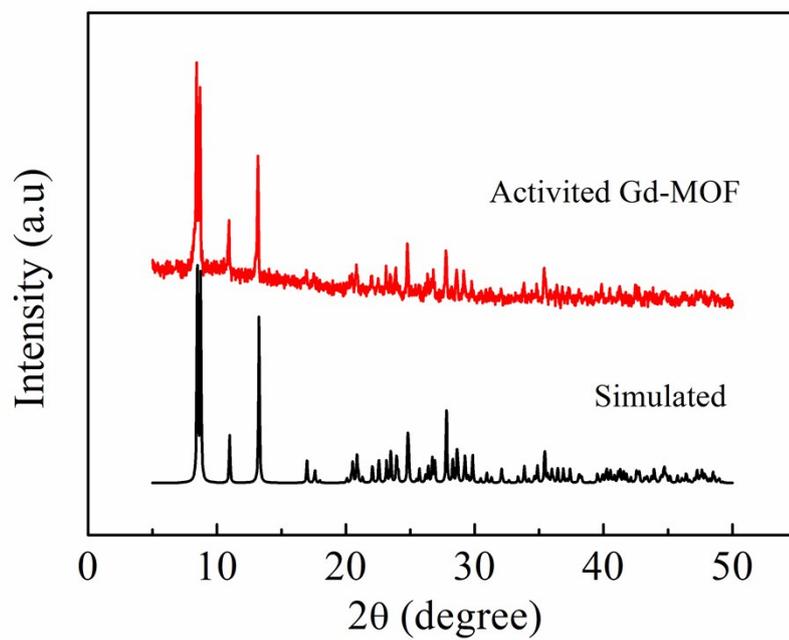


Fig. S1 PXRD patterns of activated Gd-MOF and the simulated sample.

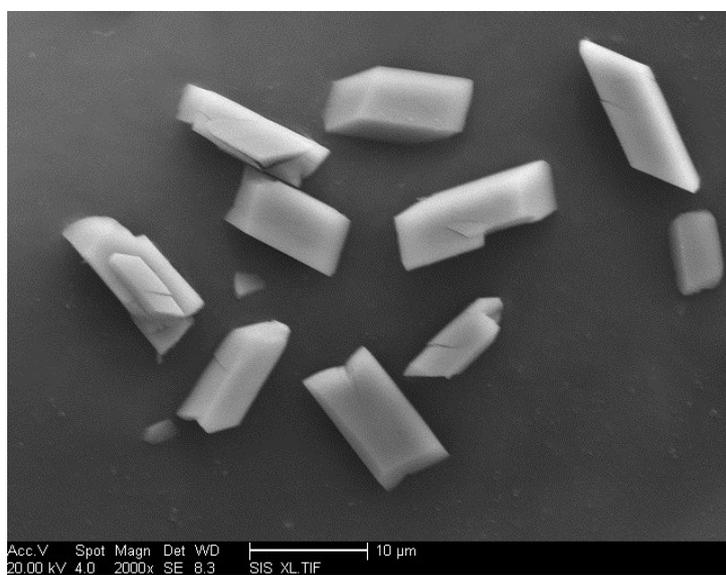


Fig. S2 SEM images of Gd-MOF.

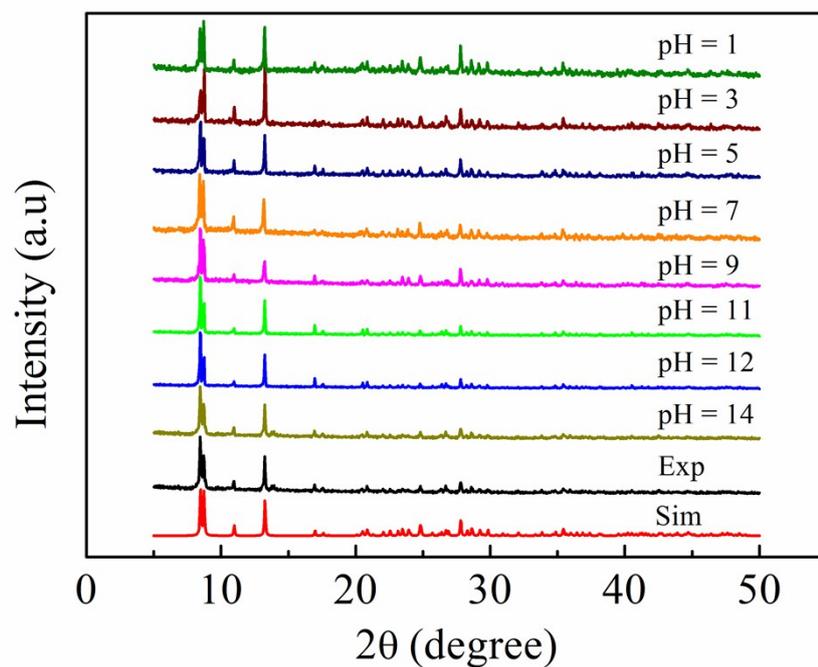


Fig. S3 PXRD patterns of Gd-MOF with the as-synthesized sample immersed in water with pH = 1 for 2 h and different pH values at room temperature for 48 h adjusted by concentrated  $\text{H}_2\text{SO}_4$  and TEOA.

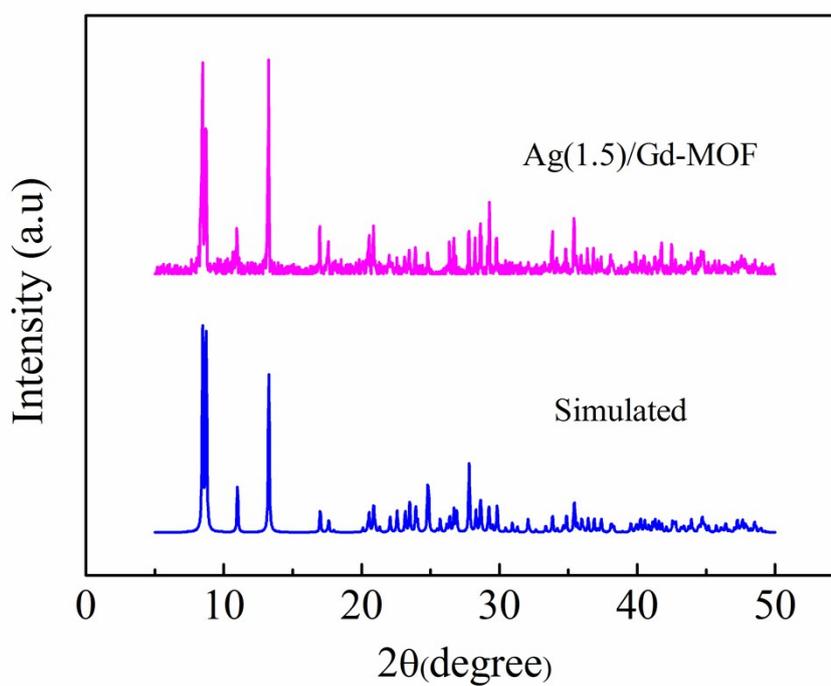


Fig. S4 PXRD patterns of Gd-MOF and Ag(1.5)/Gd-MOF.

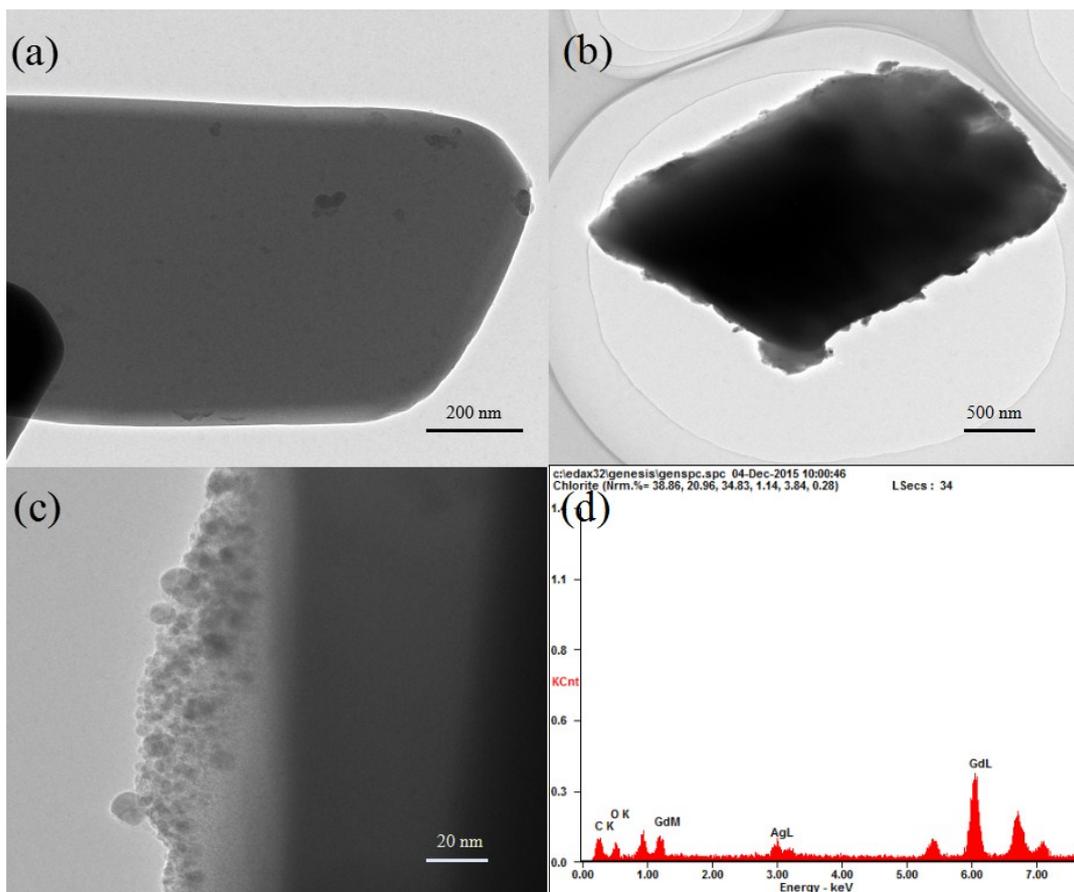


Fig. S5 TEM images of Gd-MOF (a), Ag(1.5)/Gd-MOF (b) and (c), EDX spectrum of Ag(1.5)/Gd-MOF (d).

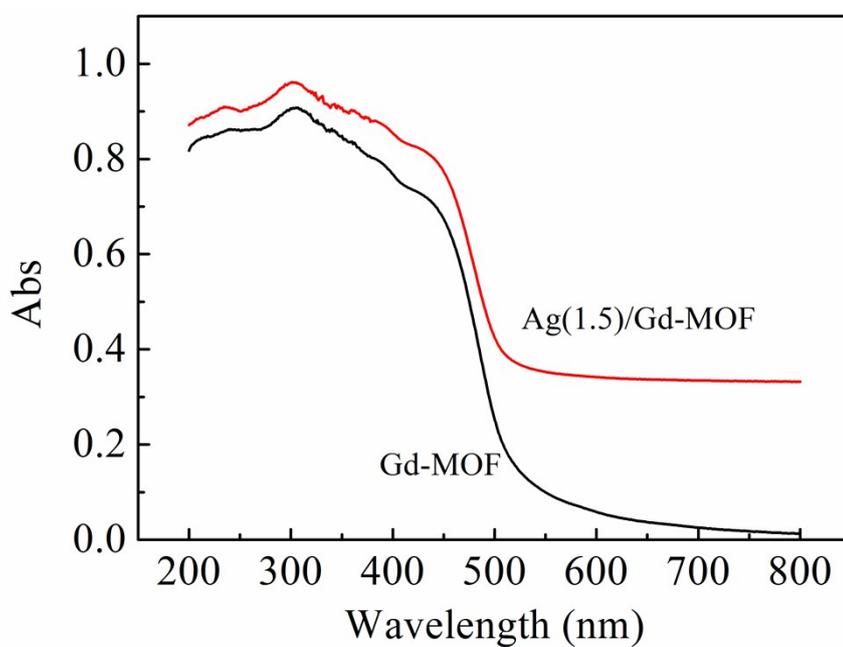


Fig. S6 UV-vis diffraction spectra of Gd-MOF and Ag(1.5)/Gd-MOF.

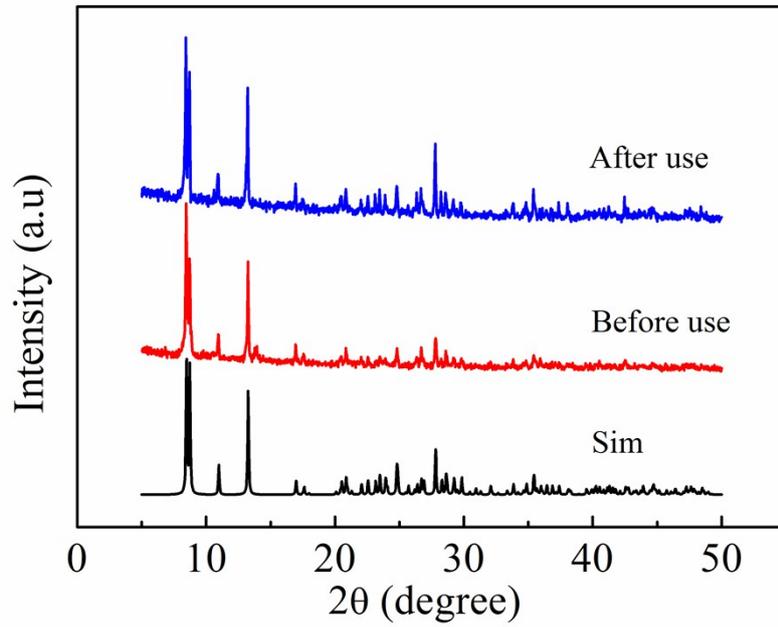


Fig. S7 PXRD patterns of Gd-MOF before and after the photocatalytic hydrogen production from water for 5h.

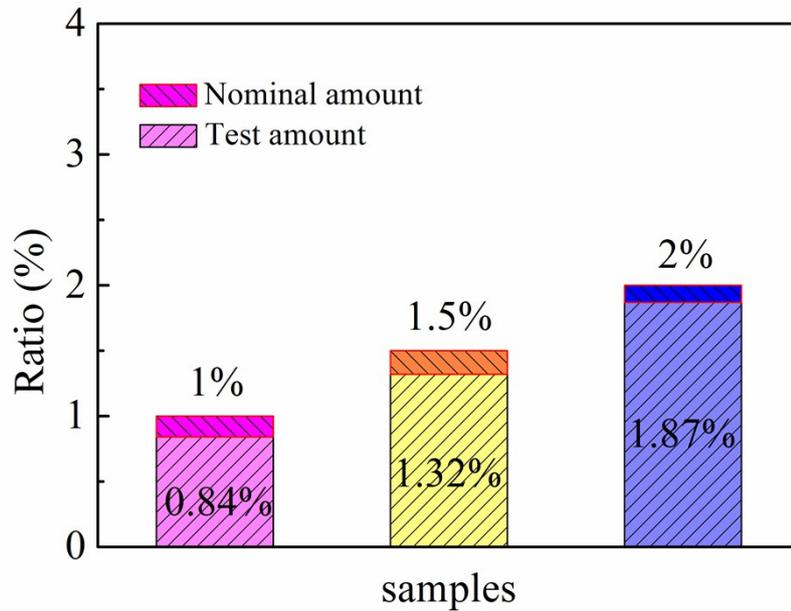


Fig. S8 Nominal amounts contrast the test amounts of Ag in Ag/Gd-MOF samples.

Table S1 Crystal data for Gd-MOF.

Compound	Gd-MOF
Formula	C <sub>8</sub> H <sub>9</sub> O <sub>7</sub> Gd
Formula weight	387.4
Crystal system	Triclinic
Space group	<i>P</i> -1
<i>a</i> /Å	4.5103(4)
<i>b</i> /Å	10.3680(9)
<i>c</i> /Å	10.8105(10)
$\alpha$ /°	78.306(8)
$\beta$ /°	79.056(7)
$\gamma$ /°	83.495(7)
<i>V</i> /Å <sup>3</sup>	484.56(8)
<i>Z</i>	2
<i>D</i> <sub>calcd</sub> /g cm <sup>-3</sup>	2.655
T/K	293(2)
$\mu$ /mm <sup>-1</sup>	6.870
F(000)	366
<i>wR</i> <sub>2</sub> [ <i>I</i> ≥ 2σ( <i>I</i> )]	0.0379
<i>R</i> <sub>1</sub> (all date)	0.0250
<i>wR</i> <sub>2</sub> (all date)	0.0390
GoF on <i>F</i> <sup>2</sup>	1.028