**Supporting Information**

# Constructing High-Efficiency $MoO_3$/Polyimide Hybrid Photocatalyst Based on Strong Interfacial Interaction

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**Table S1.** The amounts of the reactants for synthesis of the samples

| Samples* | Reactants (g) | | | |
|---|---|---|---|---|
| | MA | PMDA | $(NH_4)_6Mo_7O_{24}\cdot 4H_2O$ | $CS(NH_2)_2$ |
| PI | 0.388 | 0.669 | — | — |
| BMO | — | — | 1.227 | 1.431 |
| 0.5BMO/PI | 0.386 | 0.666 | 0.006 | 0.007 |
| 1.0BMO/PI | 0.384 | 0.662 | 0.012 | 0.014 |
| 3.0BMO/PI | 0.376 | 0.649 | 0.036 | 0.042 |
| 5.0BMO/PI | 0.368 | 0.635 | 0.060 | 0.070 |
| $MoO_3$ | — | — | 1.277 | — |
| 3.0$MoO_3$/PI | 0.376 | 0.649 | 0.036 | — |
| 3.0S/PI | 0.376 | 0.649 | — | 0.042 |

*All samples were synthesized by one-pot method, heating at the rate of 7 ℃ $min^{-1}$ up to 325 ℃ and keeping at this temperature for 4 h prior to cooling. The amounts of the reactants were calculated according to the synthesis of 1 g sample.

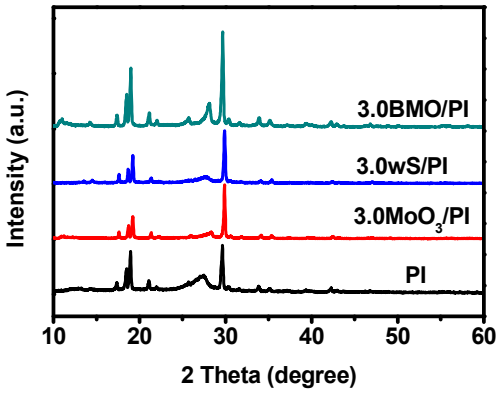


**Figure S1.** Powder XRD patterns: 3.0BMO/PI, 3.0S/PI, 3.0$MoO_3$/PI and PI.

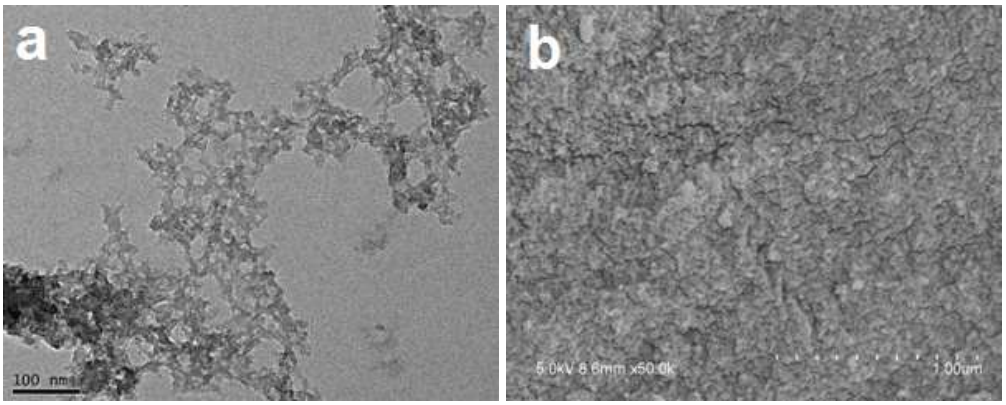


**Figure S2.** (a) TEM and (b) SEM images of PI.

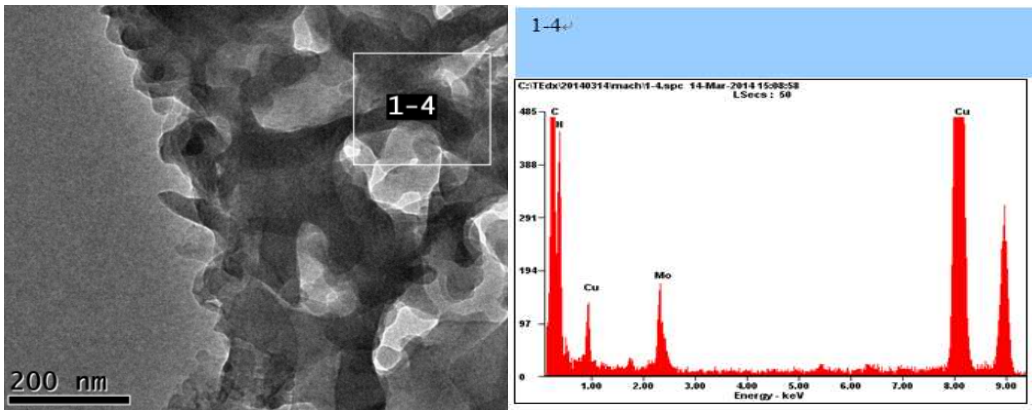


**Figure S3.** EDS analysis of 3.0BMO/PI composite photocatalyst.

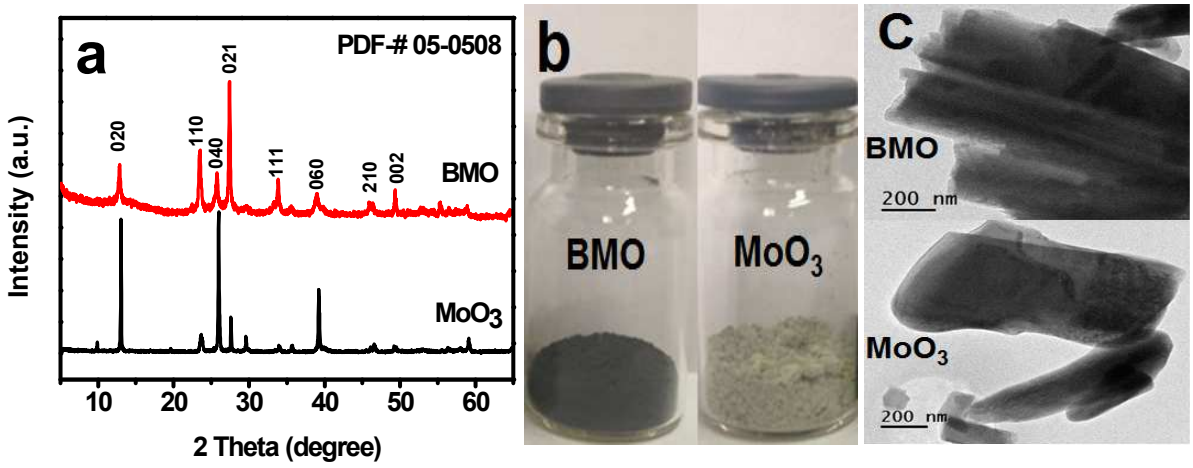


**Figure S4.** (a) XRD patterns, (b) Photographs and (c) TEM images of BMO and $MoO_3$.

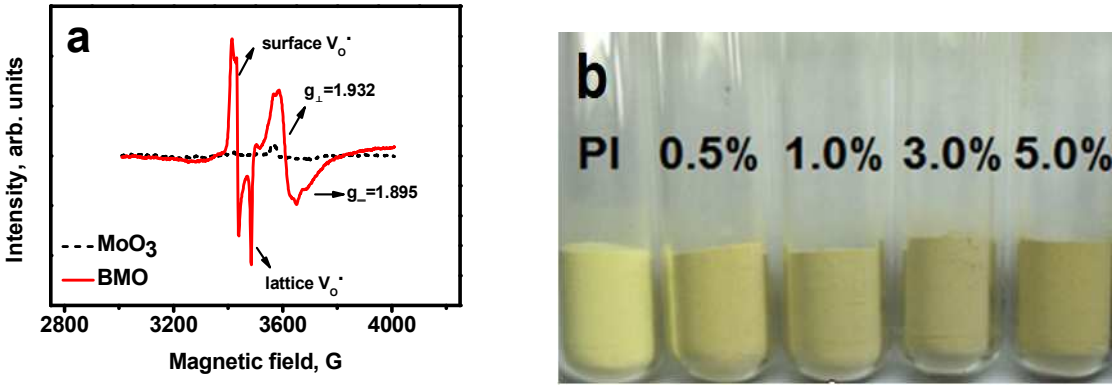


**Figure S5.** (a) EPR spectra of pristine $MoO_3$ and BMO samples at room temperature; (b) Colors of PI and (0.5-5.0)BMO/PI.

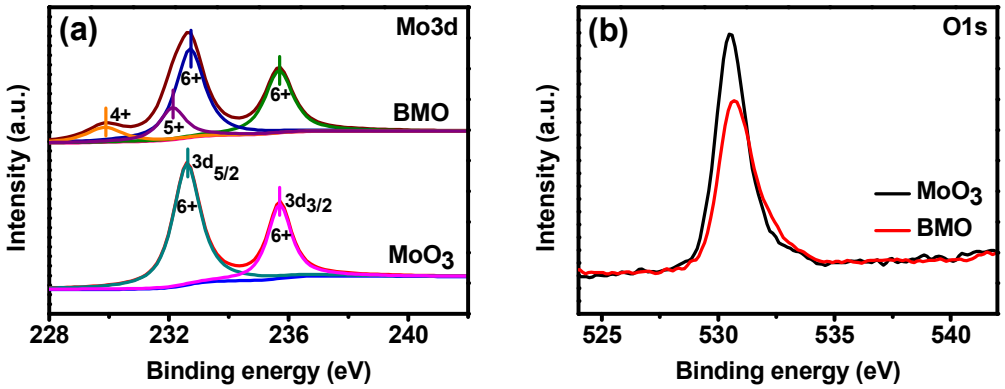


**Figure S6.** (a) Mo 3d XPS of $MoO_3$ and BMO; (b) O 1s XPS core level spectra of the pristine $MoO_3$ and BMO powders.

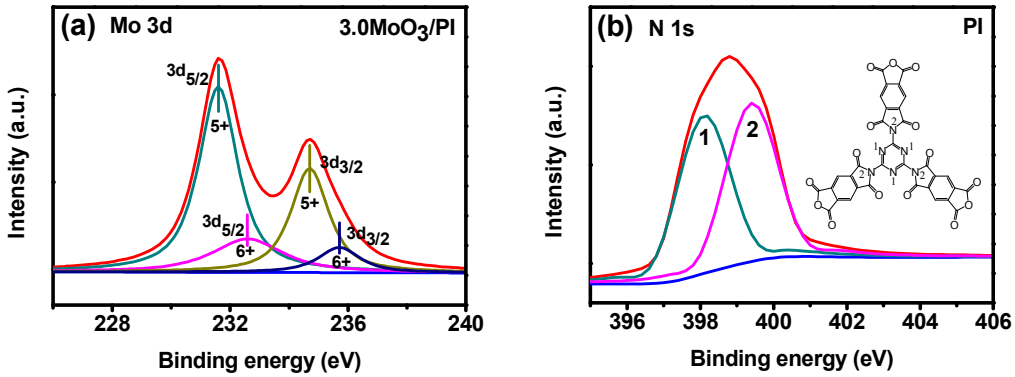


**Figure S7.** (a) Mo 3d XPS spectra of $3.0MoO_3$/PI composite; (b) N 1s XPS spectra of PI.

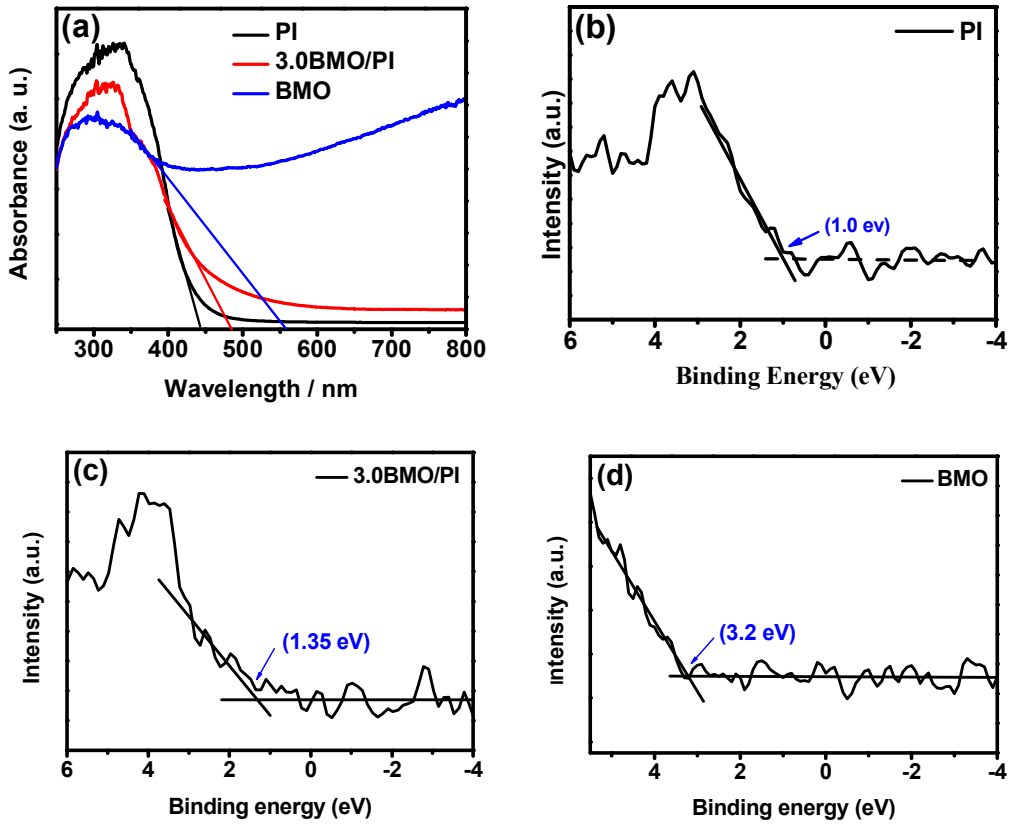


**Figure S8.** UV-vis absorption spectra (a), VBXPS spectra (b-d) of PI, 3.0BMO/PI and BMO.

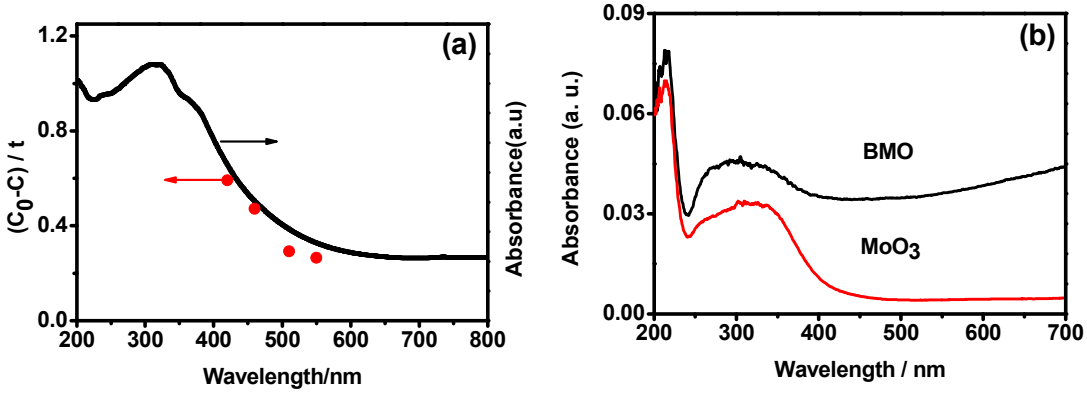


**Figure S9.** (a) Dependence of degradation activity on wavelength by 3.0BMO/PI; (b) UV-vis absorption spectra of $MoO_3$ and BMO.

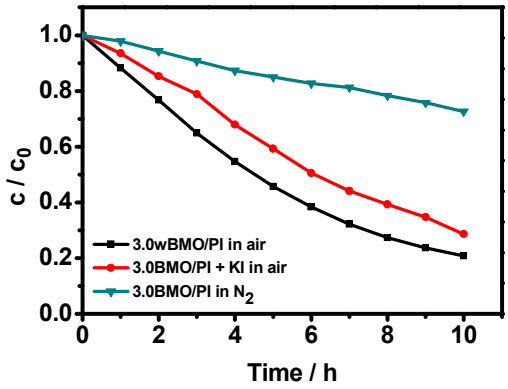


**Figure S10.** Effects of KI and purging-$N_2$ as $h^+$ and $O_2^{\bullet-}$ scavengers on the degradation of MO in the presence of 3.0BMO/PI under visible light irradiation.

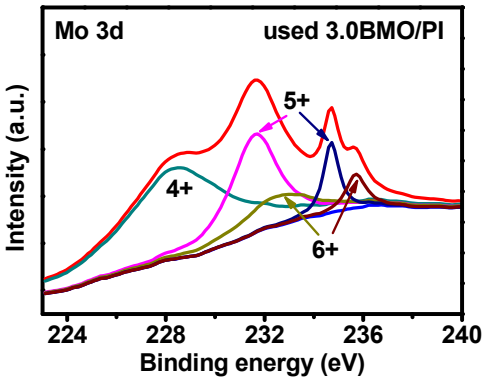


**Figure S11.** Mo 3d XPS spectra of used 3.0BMO/PI composite.