

One-pot Synthesis of Bismuth Basic Nitrate-Bi₂MoO₆ Photocatalyst for Selective Oxidation of Toluene

Tian-Qin Zeng¹, Lang Chen^{1,2*}, Bing-Hao Wang¹, Sheng Tian¹, Zhang-Jun Bai¹, Xiong Wang¹, Jun-Kang Guo^{1*} and Shuang-Feng Yin^{1*}

¹Advanced Catalytic Engineering Research Center of the Ministry of Education, College of Chemistry and Chemical Engineering, State Key Laboratory of Chemo/Biosensing and Chemometrics, Hunan University, Changsha 410082, China

²College of Chemistry and Chemical Engineering, Jishou University, Jishou 416000, China

* Corresponding authors. Emails: huagong042cl@163.com (L. Chen), jkguozd@126.com (J. K. Guo) and sf_yin@hnu.edu.cn (S. F. Yin)

Table S1. Comparison of Photocatalysts for the Selective Oxidation of Toluene Using O₂ as Oxidant (Solvent-free)

| Entry | Catalysts | Light | Toluene (mmol) | t (h) | Benzaldehyde | | Reference |
|-------|---|--|-------------------|----------|---|--------------------|-----------|
| | | | | | Formation rate ($\mu\text{mol}\cdot\text{g}^{-1}\cdot\text{h}^{-1}$) | Selectivity (%) | |
| 1 | CdS@C ₃ N ₄ | 300 W Xe lamp, $\lambda > 400$ nm | 10 | 3 | 475 | 95 | [4] |
| 2 | Cd ₃ (C ₃ N ₃ S ₃) ₂ /CdS | 300 W Xe lamp, $\lambda > 420$ nm | 9.4 | 3 | 787 | 98.5 | [9] |
| 3 | (TTA) ₆ [(α -P ₂ W ₁₈ O ₆₂)] | 300 W Xe lamp | 28.2 | 3 | 2119 | 94 | [10] |
| 4 | Cs ₃ Bi _{1.8} Sb _{0.2} Br ₉ | 300 W Xe lamp, $\lambda > 400$ nm | 47 | 3 | 4081 | 70.0 | [11] |
| 5 | CsPbBr _x Cl _{3-x} /TiO ₂ | 300 W Xe lamp, $\lambda > 420$ nm, 60 °C | 47 | 3 | 1874 | 81.1 | [12] |
| 6 | 10 %Cs ₃ Bi ₂ Br ₉ /SBA-15 | 300 W Xe lamp, $\lambda > 420$ nm | 47 | 2 | 11340 | 90 | [14] |
| 7 | Cl-BiOBr/TiO ₂ | 300 W Xe lamp, 420 < λ < 780 nm | 9.4 | 4 | 1065 | 90.6 | [15] |
| 8 | Fe-Bi ₂ WO ₆ | 300 W Xe lamp, $\lambda > 420$ nm | 10 | 5 | 1304 | 96.8 | [17] |
| 9 | NiO _x /FAPbBr ₃ /TiO ₂ | 300 W Xe lamp, AM1.5 G | 23.5 | 4 | 3800 | 86 | [21] |
| 10 | CdS-ZnS | 300 W Xe lamp | 9.4 | 3 | 1078 | 98 | [23] |
| 11 | TiO ₂ /Bi ₂ MoO ₆ | 300 W Xe lamp, $\lambda > 400$ nm | 10 | 4 | 1037 | 97.2 | [33] |
| 12 | Cs ₃ Bi ₂ Br ₉ /MXene | 300 W Xe lamp | 9.4 | 4 | 4011 | 100 | [39] |
| 13 | Cs ₃ Bi ₂ Br ₉ | 300 W Xe lamp, | 94 | 4 | 4136 | 88 | [48] |
| 14 | Cs ₃ Sb ₂ Br ₉ | 300 W Xe lamp, $\lambda > 420$ nm | 47 | 4 | 1980 | 79 | [49] |
| 15 | BBN-BMO | 300 W Xe lamp, $\lambda > 400$ nm | 18.8 | 3 | 3265 | 94.2 | This work |