



Enhancing the Photocatalytic Activity of Halide Perovskite Cesium Bismuth Bromide/Hydrogen Titanate Heterostructures for Benzyl Alcohol Oxidation

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Table S1. Comparison of photocatalysts for oxidation of BnOH to BzH and BzA.

| Materials | Condition | Conversion (%) | Selectivity (%) / Conversion Rate of BzH | Selectivity (%) / Conversion Rate of BzA | Reference |
|---|------------------------|----------------|---|---|-----------|
| CBHTNS-30 | 2 h O ₂ | 98 | 21 / 1.2 mmol g ⁻¹ h ⁻¹ | 75 / 3.7 mmol g ⁻¹ h ⁻¹ | This Work |
| | Blue Light | | | | |
| | 20 mM 10 mg 2 ml | | | | |
| Cs ₃ Bi ₂ Br ₉ /TiO ₂ | 4 h Air | 58.6 | > 99 / 1.5 mmol g ⁻¹ h ⁻¹ | - | [1] |
| | 0.1 mM | | | | |
| | 10 mg 3 ml | | | | |
| CsPbBr ₃ /TiO ₂ | 20 h O ₂ | 40 | 99/- | - | [2] |
| | Vis. Light | | | | |
| | 0.1 M 25 mg 5 ml | | | | |
| Cs ₂ TeBr ₆ | 2 h UV | - | - / 16.7 µmol | - / 1.5 µmol | [3] |
| Cs ₃ Bi ₂ Br ₉ | 2 h LED | - | - / < 6.0 µmol | - | |
| | 5 h O ₂ | | 98 / - | - | |
| TiO ₂ /Ti ₃ C ₂ | Vis. Light | 97 | | | |
| | 20 µmol | | | | |
| | 30 mg 25 ml | | | | |
| Au-Pd/ H ₂ Ti ₃ O ₇ | 6 h O ₂ | 91 | 72.6 / 139 mol/kg.h | 18.5 / - | [5] |

| | | | | | |
|---|-----------------------|------|------------|---|-----|
| | halogen light | | | | |
| | 0.1 g | | | | |
| | 10 ml | | | | |
| | 8 h | | > 98 / - | - | [6] |
| | O ₂ | | | | |
| Au ₁ Pt ₁ /TiO ₂ | Vis. Light | 65.3 | | | |
| | 0.05 M | | | | |
| | 50 mg | | | | |
| | 20 ml | | | | |
| 0.5 wt% Au-0.5 wt% Pd/TiO ₂ | 4 h | 19 | > 80.5 / - | - | [7] |
| | TBHP as oxidant agent | | | | |

Table S2. Some of the recent literature on photodegradation performance of halide perovskite and hydrogen titanate.

| Materials | Pollutant | Condition | Efficiency (%) | Reference |
|---|---|---------------------------|----------------|-----------|
| Cs ₃ Bi ₂ I ₉ perovskite | Organic dyes (RhB) | 3 h, visible light | 93 | [8] |
| Cs ₃ Bi ₂ Br ₉ perovskite | Organic dyes (MB) | 1.5 h, Visible light | 80 | [9] |
| Cs ₃ Bi ₂ Br ₉ /TiO ₂ heterojunction | 2-mercaptobenzothiazole (MBT) | 20 min, visible light | 99.9 | [1] |
| C ₃ N ₄ /Cs ₃ Bi ₂ Br ₉ composite | Organic dyes (RhB) | 1 h, solar simulator | 98 | [10] |
| 2D tri-titanate (H ₂ Ti ₃ O ₇) nanosheet | Organic dyes (MB and RhB) | 10 h, UV light | 99.9 and 92.7 | [11] |
| | | | Tar | [12] |
| | | | TNS : 52% | |
| | | | TNT : 70% | |
| 2D tri-titanate (H ₂ Ti ₃ O ₇) nanosheets (TNS) and nanotubes (TNT) | Tar and Nicotine of Cigarette smoke (CS). | 24 h using machine-smoked | Nicotine | |
| | | | TNS : 50% | |
| | | | TNT : 67% | |

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