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Bi<sub>2</sub>MoO<sub>6</sub>/BiFeO<sub>3</sub> Heterojunction Nanofibers: Enhanced Photocatalytic Activity, Charge Separation Mechanism and Magnetic Separability

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# **Bi<sub>2</sub>MoO<sub>6</sub>/BiFeO<sub>3</sub> Heterojunction Nanofibers: Enhanced Photocatalytic Activity, Charge Separation Mechanism and Magnetic Separability**

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## **ABSTRACT**

Uniform Bi<sub>2</sub>MoO<sub>6</sub> nanosheets were grown in a high dispersed fashion on electrospun BiFeO<sub>3</sub> nanofibers via a solvothermal technique. The loading amount of Bi<sub>2</sub>MoO<sub>6</sub> in the Bi<sub>2</sub>MoO<sub>6</sub>/BiFeO<sub>3</sub> heterojunction nanofibers could be controlled by adjusting the precursor concentrations in the solvothermal process. The XPS analysis, energy band position calculation and trapping experiments all proved that the Bi<sub>2</sub>MoO<sub>6</sub>/BiFeO<sub>3</sub> heterojunction is a Z-scheme heterojunction. The Z-scheme Bi<sub>2</sub>MoO<sub>6</sub>/BiFeO<sub>3</sub> heterojunction had a much higher photocatalytic activity in the visible-light photodegradation of Rhodamine B (RhB) and tetracycline hydrochloride (TC) than pure BiFeO<sub>3</sub> nanofibers or pure Bi<sub>2</sub>MoO<sub>6</sub> nanosheets. The enhanced photocatalytic activity was attributed to the formation of Z-scheme Bi<sub>2</sub>MoO<sub>6</sub>/BiFeO<sub>3</sub> heterojunctions, which could be beneficial to the separation of photogenerated electron-hole pairs. Moreover, the Bi<sub>2</sub>MoO<sub>6</sub>/BiFeO<sub>3</sub> heterojunction nanofibers could be easily separated under an external magnetic field via the ferromagnetic BiFeO<sub>3</sub>. After several cycles, the photocatalytic activity of the Bi<sub>2</sub>MoO<sub>6</sub>/BiFeO<sub>3</sub> heterojunction no longer significantly decreased suggesting that the Bi<sub>2</sub>MoO<sub>6</sub>/BiFeO<sub>3</sub> heterojunction is stable.

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