Short Communication

Preparation and Properties of Bismuth Molybdate (Bi_2MoO_6) as Photoanode for Methylene Blue Degradation

Juanqin Xue¹, Fei Li¹, Shuhao Li², Jian Zhang¹, Qiang Bi^{1,*}

¹ School of Chemistry and Chemical Engineering, Xi'an University of Architecture and Technology, Xi'an 710055, Shaanxi, China

² School of Metallurgical Engineering, Xi'an University of Architecture and Technology, Xi'an 710055, Shaanxi, China

*E-mail: Bxqiang12@126.com

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Bismuth molybdate (Bi_2MoO_6) is a promising visible-light-responsive material that can be used as a photoanode for photoelectrocatalytic oxidation. In order to enhance the photoelectrocatalytic performance of bismuth molybdate as a photoanode, this paper controlled its morphology by surfactants and investigated the relationship between its morphology and property. The base material was prepared by hydrothermal method with cetyltrimethylammonium bromide (CTAB) as surfactant, and the powder was subjected to continuous dip coating to form a nanosheet Bi_2MoO_6 photoanode. The morphology of Bi_2MoO_6 prepared by adding surfactant turned from granular shape to smaller and thinner nanosheet structure, and the band gap of Bi_2MoO_6 photoelectrode changed from 2.57 eV to 2.23 eV, with a photocurrent of around $0.029 \mu\text{A}/\text{cm}^2$, which was 1.5 times stronger than that of the Bi_2MoO_6 photoelectrode obtained without adding surfactant. Additionally, the photoelectrode degradation efficiency of methylene blue increased by 26%. The results indicated that the Bi_2MoO_6 powder obtained under the experimental conditions exhibited better photocatalytic performance. Therefore, this paper will provide theoretical basis and technical support for preparing high-performance photocatalytic materials.

Keywords: Bismuth molybdate; Cetyltrimethylammonium bromide; Morphological regulation; Surfactant; Photoelectrocatalysis

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