

Accepted Manuscript

Full Length Article

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PII: S0169-4332(18)32422-X

DOI: <https://doi.org/10.1016/j.apsusc.2018.09.011>

Reference: APSUSC 40315

To appear in: *Applied Surface Science*

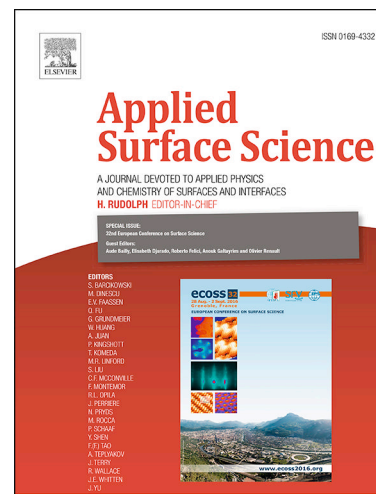
Received Date: 26 May 2018

Revised Date: 28 August 2018

Accepted Date: 1 September 2018

Please cite this article as: L. Ji, B. Li, X. Xu, F. Wang, Oxygen deficiencies and metallic Bi-mediated photocatalytic activity of bismuth tungsten oxides, *Applied Surface Science* (2018), doi: <https://doi.org/10.1016/j.apsusc.2018.09.011>

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Oxygen deficiencies and metallic Bi-mediated photocatalytic activity of bismuth tungsten oxides

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Abstract:

Herein, the metallic Bi-modified $\text{Bi}_{3.84}\text{W}_{0.16}\text{O}_{6.24}$ hybrid with oxygen deficiencies is synthesized via a facile one-pot solvothermal reduction method. The synergistic effect of the deposited Bi metal and oxygen deficiencies results in the effective separation of the photogenerated carriers in $\text{Bi}_{3.84}\text{W}_{0.16}\text{O}_{6.24}$ and the enhancement of the photo-response properties. As a result, $\text{Bi}/\text{Bi}_{3.84}\text{W}_{0.16}\text{O}_{6.24}$ exhibited outstanding visible-light photocatalytic activities and sustained cycling performance. Under visible-light irradiation, nearly 96% of RhB is degraded after 15 min. Radical trapping experiments indicate that h^+ and $\bullet\text{OH}$ are the main active species. This study provides an attractive avenue to design and fabricate highly efficient Bi-based photocatalysts, which possess a high application value in the field of environmental remediation, especially for wastewater purification.

Keywords: Photocatalysts; Bismuth tungsten oxides; Metallic Bi; Oxygen deficiencies

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