

## Accepted Manuscript

Effect of pH on Photocatalytic and Photoelectrochemical (PEC) Properties of Monoclinic Bismuth Vanadate

Ahmad Tayyebi, Tayyebeh Soltani, Byeong-Kyu Lee

PII: S0021-9797(18)31020-8  
DOI: <https://doi.org/10.1016/j.jcis.2018.08.095>  
Reference: YJCIS 24028

To appear in: *Journal of Colloid and Interface Science*

Received Date: 5 June 2018  
Revised Date: 26 August 2018  
Accepted Date: 27 August 2018

Please cite this article as: A. Tayyebi, T. Soltani, B-K. Lee, Effect of pH on Photocatalytic and Photoelectrochemical (PEC) Properties of Monoclinic Bismuth Vanadate, *Journal of Colloid and Interface Science* (2018), doi: <https://doi.org/10.1016/j.jcis.2018.08.095>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Effect of pH on Photocatalytic and Photoelectrochemical (PEC) Properties of Monoclinic Bismuth Vanadate

Ahmad Tayyebi<sup>1</sup>, Tayyebeh Soltani<sup>1</sup>, Byeong-Kyu Lee\*

Department of Civil and Environment Engineering, University of Ulsan, Daehakro 93,  
Namgu, Ulsan 44610, Republic of Korea

Email: [bklee@ulsan.ac.kr](mailto:bklee@ulsan.ac.kr)

<sup>1</sup>: Equal contribution

## Abstract

Monoclinic bismuth vanadate (c-BVO) was prepared via simple calcination of solvothermally processed tetrahedral BiVO<sub>4</sub>. The physicochemical and morphological properties of c-BVO demonstrated the successful synthesis of the photoactive monoclinic phase from the tetrahedral phase, which has low photoactivity properties. The photoactivities of c-BVO were investigated using the photodegradation of methylene blue (MB) and photoelectrochemical (PEC) measurements in acidic (pH=2.5), neutral (pH=6.5) and basic (pH=9.5) media. The photocatalytic activity of c-BVO was increased with increasing pH, achieved 99% MB degradation in the basic condition, compared with 70 and 45 % in the neutral and acidic media, respectively. Although the tetrahedral BiVO<sub>4</sub> showed mainly adsorption with negligible photodegradation, c-BVO demonstrated both good adsorption and photodegradation activities. The PEC results indicated that the photocurrent density was affected by both pH and applied voltage. Impedance measurements showed faster charge transfer in the neutral condition than in the acidic and basic electrolytes. The incident photon conversion efficiency (IPCE) showed very

Download English Version:

<https://daneshyari.com/en/article/10146260>

Download Persian Version:

<https://daneshyari.com/article/10146260>

[Daneshyari.com](https://daneshyari.com)