

## Accepted Manuscript

Flowing water enabled piezoelectric potential of flexible composite film for enhanced photocatalytic performance

Baoying Dai, Hengming Huang, Fulei Wang, Chunhua Lu, Jiahui Kou, Lianzhou Wang, Zhongzi Xu

PII: S1385-8947(18)30574-6  
DOI: <https://doi.org/10.1016/j.cej.2018.04.008>  
Reference: CEJ 18808

To appear in: *Chemical Engineering Journal*

Received Date: 14 December 2017  
Revised Date: 7 March 2018  
Accepted Date: 4 April 2018

Please cite this article as: B. Dai, H. Huang, F. Wang, C. Lu, J. Kou, L. Wang, Z. Xu, Flowing water enabled piezoelectric potential of flexible composite film for enhanced photocatalytic performance, *Chemical Engineering Journal* (2018), doi: <https://doi.org/10.1016/j.cej.2018.04.008>



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.

# Flowing water enabled piezoelectric potential of flexible composite film for enhanced photocatalytic performance

Baoying Dai<sup>a,b,c</sup>, Hengming Huang<sup>a,b,c,d</sup>, Fulei Wang<sup>e</sup>, Chunhua Lu<sup>a,b,c\*</sup>, Jiahui Kou<sup>a,b,c\*</sup>, Lianzhou Wang<sup>d</sup>, Zhongzi Xu<sup>a,b,c</sup>

<sup>a</sup> State Key Laboratory of Materials-Oriented Chemical Engineering, College of Materials Science and Engineering, Nanjing Tech University, Nanjing, 210009, P. R. China.

<sup>b</sup> Jiangsu Collaborative Innovation Center for Advanced Inorganic Function Composites, Nanjing Tech University, Nanjing, 210009, P. R. China.

<sup>c</sup> Jiangsu National Synergetic Innovation Center for Advanced Materials (SICAM), Nanjing Tech University, Nanjing, 210009, P. R. China.

<sup>d</sup> Nanomaterials Centre, School of Chemical Engineering and Australian Institute for Bioengineering and Nanotechnology, University of Queensland, Brisbane, Queensland, 4072, Australia.

<sup>e</sup> State Key Laboratory of Crystal Materials, Shandong University, Jinan, 250100, P. R. China.

## Corresponding Author

\* Prof. Chunhua Lu (E-mail: chhlu@njtech.edu.cn, Tel: (+86)025-83587252).

\* Associate Prof. Jiahui Kou (E-mail: jhkou@njtech.edu.cn).

## Abstract

Fast charge transfer and low recombination rate are two vital requirements to achieve high photocatalytic activity. In this work, we report the conversion of flowing water energy to piezoelectric potential on a new type of flexible composite film PVDF- $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$ - $\text{BiOCl}_{0.5}\text{Br}_{0.5}$  (PV-N-B) containing PVDF- $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$  (PV-N) substrate and  $\text{BiOCl}_{0.5}\text{Br}_{0.5}$ , which significantly boosts the charge transfer of the photocatalytic composite film, resulting in improved photocatalytic capability by 2.33 times. The role of piezoelectric potential in photocatalysis process has been discussed in detail and the results reveal that higher potential output is more beneficial for photocatalytic performance enhancement. Moreover, the photocatalytic degradation intermediates of tetracycline (TC) over PV-N-B were detected by liquid chromatography-mass spectrometer and the possible photodegradation pathway of TC

Download English Version:

<https://daneshyari.com/en/article/6579058>

Download Persian Version:

<https://daneshyari.com/article/6579058>

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