

## Accepted Manuscript

Synthesis of Supported  $\text{SiW}_{12}\text{O}_{40}$ -based Ionic Liquid Catalyst Induced Solvent-free Oxidative Deep-desulfurization of Fuels

Suhang Xun, Wenshuai Zhu, Yonghui Chang, Hongping Li, Ming Zhang, Wei Jiang, Dan Zheng, Yuejiao Qin, Huaming Li

PII: S1385-8947(15)01662-9  
DOI: <http://dx.doi.org/10.1016/j.cej.2015.12.005>  
Reference: CEJ 14508

To appear in: *Chemical Engineering Journal*

Received Date: 6 July 2015  
Revised Date: 25 November 2015  
Accepted Date: 1 December 2015

Please cite this article as: S. Xun, W. Zhu, Y. Chang, H. Li, M. Zhang, W. Jiang, D. Zheng, Y. Qin, H. Li, Synthesis of Supported  $\text{SiW}_{12}\text{O}_{40}$ -based Ionic Liquid Catalyst Induced Solvent-free Oxidative Deep-desulfurization of Fuels, *Chemical Engineering Journal* (2015), doi: <http://dx.doi.org/10.1016/j.cej.2015.12.005>

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.



# Synthesis of Supported SiW<sub>12</sub>O<sub>40</sub>-based Ionic Liquid Catalyst Induced Solvent-free Oxidative Deep-desulfurization of Fuels

SuhangXun<sup>a</sup>, WenshuaiZhu<sup>a\*</sup>, Yonghuichang<sup>a</sup>, Hongping Li<sup>a</sup>, Ming Zhang<sup>b</sup>, Wei Jiang<sup>b</sup>, Dan Zheng<sup>a</sup>,  
YuejiaoQin<sup>a</sup>, Huaming Li<sup>b\*</sup>

<sup>a</sup>*School of Chemistry and Chemical Engineering, Jiangsu University, Zhenjiang, 212013, P. R. China*

<sup>b</sup>*Institute for Energy Research, Jiangsu University, Zhenjiang, 212013, P. R. China*

\*Corresponding author: Tel.: +86-511-88791800; Fax: +86-511-88791708;

E-mail address: zhuws@ujs.edu.cn (W. S. Zhu), lhm@ujs.edu.cn (H. M. Li)

## Abstract

A supported SiW<sub>12</sub>O<sub>40</sub>-based ionic liquid (SiW-IL) catalyst with high catalytic activity is designed and synthesized by sol-gel method. The supported catalyst had amphiphilic property, making it exhibit good catalytic performance in solvent-free oxidative desulfurization system. The removal of dibenzothiophene (DBT) with the supported catalyst reached 99.9%, while the sulfur removal is only 6.3% with SiW-IL. The characterizations show that SiW-IL is supported on the carrier successfully and the supported catalyst had a sheet-shaped morphology. Then, various of experimental conditions were taken into consideration to investigate the influences of the desulfurization efficiency and the optimal conditions were obtained. Additionally, sulfur removal of different substrates decreased in the following orders: DBT > 4-MDBT > 4, 6-DMDBT > BT under the same conditions. GC-MS analysis was employed to study the mechanism of the desulfurization, DBT sulfone was proved to be the oxidizing product of DBT. Moreover, the supported catalyst had a good thermal and chemical stability, and sulfur removal of DBT still remained 96.2% after recycling 7 times.

**Keywords:** supported catalyst; ionic liquid; amphiphilic; solvent-free; desulfurization.

Download English Version:

<https://daneshyari.com/en/article/6582397>

Download Persian Version:

<https://daneshyari.com/article/6582397>

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