

Accepted Manuscript

Comparison of toxicity of Fe/Ni and starch-stabilized Fe/Ni nanoparticles toward *Escherichia coli*

Haoran Dong, Yujun Cheng, Yue Lu, Kunjie Hou, Lihua Zhang, Long Li, Bin Wang, Yaoyao Wang, Qin Ning, Guangming Zeng

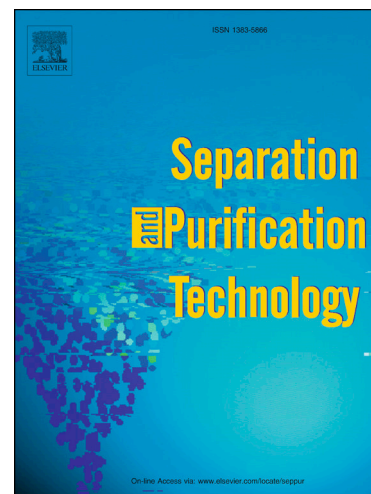
PII: S1383-5866(18)32527-9
DOI: <https://doi.org/10.1016/j.seppur.2018.08.042>
Reference: SEPPUR 14863

To appear in: *Separation and Purification Technology*

Received Date: 23 July 2018
Revised Date: 18 August 2018
Accepted Date: 23 August 2018

Please cite this article as: H. Dong, Y. Cheng, Y. Lu, K. Hou, L. Zhang, L. Li, B. Wang, Y. Wang, Q. Ning, G. Zeng, Comparison of toxicity of Fe/Ni and starch-stabilized Fe/Ni nanoparticles toward *Escherichia coli*, *Separation and Purification Technology* (2018), doi: <https://doi.org/10.1016/j.seppur.2018.08.042>

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.



Comparison of toxicity of Fe/Ni and starch-stabilized Fe/Ni nanoparticles toward *Escherichia coli*

Haoran Dong^{1,2,*}, Yujun Cheng^{1,2}, Yue Lu^{1,2}, Kunjie Hou^{1,2}, Lihua Zhang^{1,2}, Long Li^{1,2}, Bin Wang^{1,2}, Yaoyao Wang^{1,2}, Qin Ning^{1,2}, Guangming Zeng^{1,2}

1. College of Environmental Science and Engineering, Hunan University, Changsha, Hunan 410082, China.
2. Key Laboratory of Environmental Biology and Pollution Control (Hunan University), Ministry of Education, Changsha, Hunan 410082, China

*Corresponding author. E-mail: dongh@hnu.edu.cn

Abstract:

This study examined the toxicities of Fe/Ni and starch-stabilized Fe/Ni (S-Fe/Ni) nanoparticles (NPs) toward *Escherichia coli*. The inactivation of *E. coli* by Fe/Ni NPs was concentration- and time-dependent. Fe/Ni NPs exhibited a stronger toxicity than the bare Fe⁰ NPs (i.e., Ni=0 wt%), revealing that the loading of Ni increased the toxicity of Fe⁰ NPs. However, there was no positive correlation between Ni content and the toxicity of Fe/Ni NPs when Ni content increased from 1 wt% to 5 wt%. The starch coating could alleviate the toxicity of Fe/Ni NPs, depending on starch concentration. Transmission Electron Microscopy analysis demonstrates that membrane disruption and cellular internalization of NPs occurred for *E. coli* after exposure to the Fe/Ni NPs. The NPs might have reacted with the carboxyl, ester and amine groups on the cell surface, as indicated by the Fourier Transform Infrared

Download English Version:

<https://daneshyari.com/en/article/11003283>

Download Persian Version:

<https://daneshyari.com/article/11003283>

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