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### Removal of Cd(II) from Aqueous Solution by Electrospun Nylon 6 Nanofibrous Nonwoven Containing Attapulgite

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**Authors** [Wei Wei](#), [Jen Taut Yeh](#), [Xin Ling Wang](#), [Peng Li](#), [Wei Wei](#)

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## Removal of Cd(II) from aqueous solution by Electrospun Nylon 6 Nanofibrous Nonwoven containing Attapulgite

Wei Wei<sup>1,a</sup>, Jen-Taut Yeh<sup>1,3,b</sup>, Xin-Ling Wang<sup>2,c</sup>, Peng Li<sup>3,d</sup> and Wei Wei<sup>5,e</sup>

<sup>1</sup>Department of Textile Science and Engineering, Wuhan Textile University, Wuhan, China

<sup>2</sup>Department of Polymer Science and Engineering, Shanghai Jiao Tong University, Shanghai, China

<sup>3</sup> Faculty of Material Science and Engineering, Hubei University, Wuhan, China

<sup>4</sup>Department and Graduate School of Polymer Engineering

National Taiwan University of Science and Technology, Taipei, Taiwan

<sup>5</sup>Wuhan Huaili Environmental Technology Co. LTD., Wuhan, China

<sup>a</sup>[wei.wei@wtu.edu.cn](mailto:wei.wei@wtu.edu.cn), <sup>b</sup>[jyeh@mail.ntust.edu.tw](mailto:jyeh@mail.ntust.edu.tw), <sup>c</sup>[xlwang@sjtu.edu.cn](mailto:xlwang@sjtu.edu.cn), <sup>d</sup>[lemon0429@yahoo.cn](mailto:lemon0429@yahoo.cn),  
<sup>e</sup>[ww1542468@yahoo.com.cn](mailto:ww1542468@yahoo.com.cn)

**Keywords:** electrospun fiber, nylon 6, attapulgite, adsorption

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### Introduction

Attapulgite (ATP) is a natural clay mineral together with sepiolite that forms the group of fibrous clay minerals. Typical dimensions of ATP are about 0.5~1  $\mu\text{m}$  in length and approximately 10~50 nm across. It was found that a lot of micro-aperture and micro-channel in ATP crystal structure, which may be filled with water or organic molecules [1-4]. Due to its unique structure, ATP used widely as absorbent, pesticide carrier, catalyst support, decolorizing agent etc.

Electrospinning may produce nanofibers with diameters ranging from several microns to less than 10 nm. Electrospun nanofibrous nonwoven possessing several attractive attributes, such as high porosity, interconnected open pore structure and a large surface area per unit volume, shows promise for the applications such as filtration [5, 6], drug delivery [7] and tissue scaffolds [8, 9].

In this study, a simple processing route can be used to incorporate ATP particles into electrospun nylon 6 (NY6) fibrous nonwoven by adsorption. The ATP powders are loaded onto surfaces of NY6 nanofibers by immersing the NY6 nanofibrous nonwoven in a bath containing ATP dispersion under ultrasonication. The NY6 nanofibrous nonwoven containing ATP nano particles was explored as "nano adsorbent" to remove Cd(II) ions from Cd(II) aqueous solution, which was recognized as toxic element damaging the kidney, liver and nervous system as it enters the human body [10]. The effects of various parameters on adsorption properties, such as contact time, pH values of Cd(II) solution and initial Cd(II) concentration were investigated.

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