

Accepted Manuscript

Selective recognition and separation of luteolin based on the molecular imprinted hollow SnO_2 and boronate affinity

Qiang Jia, Yue Ma, Yinxian Peng, Yanhong Liu, Wenli Zhang

PII: S1385-8947(18)30316-4
DOI: <https://doi.org/10.1016/j.cej.2018.02.103>
Reference: CEJ 18582

To appear in: *Chemical Engineering Journal*

Received Date: 20 February 2018
Accepted Date: 23 February 2018

Please cite this article as: Q. Jia, Y. Ma, Y. Peng, Y. Liu, W. Zhang, Selective recognition and separation of luteolin based on the molecular imprinted hollow SnO_2 and boronate affinity, *Chemical Engineering Journal* (2018), doi: <https://doi.org/10.1016/j.cej.2018.02.103>



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.

Selective recognition and separation of luteolin based on the molecular imprinted hollow SnO₂ and boronate affinity

Qiang Jia^{a,1}, Yue Ma^{b,1}, Yinxian Peng^{a,*}, Yanhong Liu^{b,*}, Wenli Zhang^{b,*}

^a School of Environmental and Chemical Engineering, Jiangsu University of Science and Technology, Zhenjiang, Jiangsu 212003, China.

^b School of Chemistry and Chemical Engineering, Jiangsu University, Zhenjiang 212013, China.

Abstract: Molecular imprinted hollow SnO₂ microspheres (Ho-SnO₂@MIPs) integrated with boronate affinity ability were fabricated via atom transfer radical polymerization, and then they were adopted as ideal adsorbents for *cis*-diol containing luteolin (LTL) recognition and separation. Ho-SnO₂@MIPs possessed uniform size (200 nm), porous and hollow structure, appropriate BET surface area (118.6 m² g⁻¹), and high-density boronate affinity sites (0.22 mg m⁻²), endowing them highly specific uptake and fast separation properties. Due to the merit of pH responsive boronate affinity, the reversible interaction of boronic acid groups and LTL was regulated by the pH value facilely, which was benefit for the controlled recognition and release. In the batch mode experiments, the quick binding equilibrium (within 60 min) and a rather high specific binding capacity (46.81 mg g⁻¹) at 298 K were observed, and Ho-SnO₂@MIPs also displayed high rebinding selectivity to LTL. By a purification process, a commercially available LTL with 85% purity could be easily extracted and concentrated to 95.28% purity by Ho-SnO₂@MIPs, and the purified products possessed the similar antibacterial performance with standard substance.

Keywords: Molecular imprinting, Hollow structure, Selective separation, Boronate affinity, Luteolin

1. INTRODUCTION

¹ The authors have equal contribution to this work.

* Corresponding author. Tel.: +086 88791708; fax: +086 88791800.

E-mail: pyxhx@just.edu.cn (Y.X. Peng); liuyh@ujs.edu.cn (Y.H. Liu); jsdxzhwl@126.com (W.L. Zhang)

Download English Version:

<https://daneshyari.com/en/article/6579757>

Download Persian Version:

<https://daneshyari.com/article/6579757>

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