Selective detection of TNT using molecularly imprinted polymer microsphere

Haixia Zhao\textsuperscript{a}, Xianli Ma\textsuperscript{b}, Yanbin Li\textsuperscript{a}, Ruikui Du\textsuperscript{a}, Zhengguo Zhang\textsuperscript{a}, Fuqiang An\textsuperscript{a,*}, Baojiao Gao\textsuperscript{a,}\textsuperscript{*}

\textsuperscript{a}Chemical Department, North University of China, Taiyuan 030051, P.R. China, Tel. +86 351 3921414; Fax: +86 351 3922118; Email: qqfengxiaqin@126.com (F. An); anfuqiang@nuc.edu.cn (B. Gao)

\textsuperscript{b}Chemical Department, Guilin Medical University, Guilin 541000, P.R. China

Received 18 September 2013; Accepted 4 April 2014

\textbf{ABSTRACT}

The rapid detection of nitroaromatic explosive in low concentration sample or complex matrices is of importance. In this paper, 2,4,6-trinitrotoluene (TNT) molecularly imprinted polyvinyl alcohol microspheres, MIP-CPVA, are synthesized in inverse suspension system using TNT as template, PVA as functional polymer, and glutaraldehyde as cross-linker. The MIP-CPVA possesses high affinity, specific recognition ability, and excellent selectivity towards TNT. The saturated adsorption capacity could reach to 10.62 mg g\textsuperscript{-1}, and the selectivity coefficients relative to DNT is 12.44. In additional, MIP-CPVA can be used as the column packing of gas chromatograph to separate and detect nitroaromatic, and the result is very satisfactory.

\textit{Keywords:} Molecularly imprinted polymer; 2,4,6-trinitrotoluene; Polyvinyl alcohol; Gas chromatograph; Separation

\textsuperscript{*}Corresponding authors.

1944-3994/1944-3986 © 2014 Balaban Desalination Publications. All rights reserved.