



Removal of arsenic from ammoniacal etching waste liquor by 3-(2-aminoethylamino)propyltrimethoxysilane functionalized silica gel sorbent

Hong-Tao Fan*, Jing Li, Meng-Meng Guo, Xue-Lei Fan, Dong-Sheng Zhang, Zi-Jie Su, Juan Wang

College of Applied Chemistry, Shenyang University of Chemical Technology, Shenyang 110142, China
Tel. +86 24 89383297; email: httyf_77@163.com

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ABSTRACT

3-(2-Aminoethylamino)propyltrimethoxysilane (AAPTS) functionalized silica gel (AAPTS/SiO₂) was synthesized by a sol-gel process and was used for the arsenic removal from ammoniacal etching waste liquor which was oxidized by H₂O₂. The AAPTS/SiO₂ sorbent reached absorption saturation at 20 min and had a substantial binding capacity in the range of pH 4.7–10.2. The maximum static adsorption capacity of AAPTS/SiO₂ sorbent for arsenic was 16.1 mg g⁻¹. Equilibrium data fitted perfectly with Langmuir isotherm model compared to Freundlich isotherm model. The removal rate of arsenic by AAPTS/SiO₂ sorbent was 95.4% at the optimal conditions from ammoniacal etching waste liquor. Results showed that AAPTS/SiO₂ sorbent could be used for the arsenic removal from ammoniacal etching waste liquor.

Keywords: Removal; Arsenic; 3-(2-Aminoethylamino)propyltrimethoxysilane; Silica gel; Etching waste liquor

*Corresponding author.