

论文

纳米TiO<sub>2</sub>对Ag(I)配合物的吸附

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摘要:

利用纳米TiO<sub>2</sub>的表面吸附活性, 以[S<sub>2</sub>O<sub>3</sub>]<sup>2-</sup>为络合剂, 应用火焰原子吸收光谱检测方法, 高效吸附分离了水中痕量Ag(I)。系统研究了纳米TiO<sub>2</sub>的晶体结构、溶液的pH值、吸附时间、Ag(I)的起始浓度及常见共存离子对吸附率的影响, 确定了最佳吸附条件。FTIR光谱分析结果表明, Ag(I)配合物以物理作用吸附在纳米TiO<sub>2</sub>颗粒表面。纳米TiO<sub>2</sub>对Ag(I)的吸附等温线为S型, 表现出多分子层吸附特征。硝酸和硫脲混合溶液可将吸附在TiO<sub>2</sub>纳米颗粒表面的Ag(I)全部洗脱。

关键词: 纳米TiO<sub>2</sub> 纳米吸附剂 吸附等温线

Adsorption of Coordination Compound of Ag(I) on TiO<sub>2</sub> Nanoparticles

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Abstract:

An efficient separation of coordination compound of Ag(I) was carried out taking TiO<sub>2</sub> nanoparticles as adsorbent, [S<sub>2</sub>O<sub>3</sub>]<sup>2-</sup> anion as ligand and Flame Atomic Absorption Spectrophotometer (FAAS) as detector to determine the concentration of Ag(I). The effect of the crystalline structure of TiO<sub>2</sub> nanoparticles, pH values, adsorption time, initial concentration of Ag(I), and some coexistent ion on the adsorption rate was systematically studied. The FTIR spectrum show that the coordination compound of Ag(I) is physically adsorbed on the surface of TiO<sub>2</sub> nanoparticles. The adsorption isotherm of Ag(I) on nano-TiO<sub>2</sub> show "S" type, which can be explained by the multi-molecular layer adsorption. The Ag(I) adsorbed on TiO<sub>2</sub> nanoparticles could be eluted completely by mixed solution of nitric acid(1 mol/L) and sulfourea(2 g/L). The above experiment results would be valuable for using the nano-adsorbents to separate trace Ag(I) in waste water.

Keywords: TiO<sub>2</sub> nanoparticles Nano-adsorbent Adsorption isotherm

收稿日期 2008-06-03 修回日期 1900-01-01 网络版发布日期

DOI:

基金项目:

通讯作者: 张霞

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