

论文

锌(II)、镉(II)在伊利石上的吸附及解吸特征研究

李春玲,岳钦艳,李颖, 孙大明

1. 山东省水环境污染控制与资源化重点实验室, 山东大学环境科学与工程学院, 山东 济南 250100; 2. 山东省潍坊市环境监测中心站, 山东 潍坊 261041

摘要:

研究了Zn²⁺和Cd²⁺在伊利石上的吸附、竞争吸附及其解吸特征, 以及初始pH、可溶性腐殖酸与温度对吸附的影响。金属离子的吸附量随初始pH的升高而增大, 随温度升高而减小。可溶性腐殖酸的存在可以增加金属离子的吸附量。腐殖酸的浓度越高, 金属离子的吸附量增加越多。无论是单组分吸附还是竞争吸附的的吸附量次序都是:

Zn²⁺+Cd²⁺吸附动力学实验表明Zn²⁺和Cd²⁺在伊利石上的吸附符合伪二级吸附速率模型。计算得到Zn²⁺和Cd²⁺在伊利石上吸附的Ea分别为41 04和39 15 kJ / mol, 表明吸附过程以物理吸附为主。吸附在伊利石上的Cd²⁺和Cd²⁺在水、HCl、NaOH和NaCl中的解吸量的关系是:HCl>NaCl>NaOH> H₂O。

关键词: 锌; 镉; 伊利石; 吸附; 解吸

Adsorption and desorption of zinc (II) and cadmium (II) on illite

LI Chun ling, YUE Qin yan, LI Ying, SUN Da ming

1. Shandong Key Laboratory of Water Pollution Control and Resource Reuse, School of Environmental Science and Engineering, Shandong University, Jinan 250100, Shandong, China; 2. Weifang Environmental Monitoring Central Station, Weifang 261041, Shandong, China

Abstract:

Adsorption, competitive adsorption and desorption of zinc (II), cadmium (II) on illite were studied, and the effects of initial pH, humic acid and temperature were also determined. The adsorption capacities of the metal ions increased with initial pH increasing, and decreased with temperature increasing. The adsorption capacities were increased more with increasing concentration of humic acid. Both single component and competitive adsorption, the order of the adsorption capacities was: Cd²⁺>Zn²⁺. The results showed that the adsorption process accorded with the pseudo second order equation. The calculated activation energy of Zn²⁺, Cd²⁺ on illite were 41 04 / mol and 39 15 / mol, which indicated that the adsorption process belongs to physical adsorption. The desorption capacities of Zn²⁺, Cd²⁺ adsorbed by illite in different solutions were in the following order, HCl>NaCl>NaOH>H₂O.

Keywords: zinc; cadmium; illite; adsorption; desorption

收稿日期 2009-04-27 修回日期 网络版发布日期

DOI:

基金项目:

山东省自然科学基金资助项目(Y2007B18)

通讯作者: 岳钦艳(1958),女,教授,博士生导师,博士,研究方向为水污染控制与资源化等.

作者简介:

本刊中的类似文章

扩展功能

本文信息

Supporting info

PDF(353KB)

[HTML全文]

(\$ {article.html | WenJianDaXiao} KB)

参考文献[PDF]

参考文献

服务与反馈

把本文推荐给朋友

加入我的书架

加入引用管理器

引用本文

Email Alert

本文关键词相关文章

▶ 锌; 镉; 伊利石; 吸附; 解吸

本文作者相关文章