

孙慧敏,殷宪强,王益权.pH对粘土矿物胶体在饱和多孔介质中运移的影响[J].环境科学学报,2012,32(2):419-424

### pH对粘土矿物胶体在饱和多孔介质中运移的影响

### The effect of pH on the transport of clay mineral colloid in saturated porous media

关键词: [pH](#) [高岭石](#) [蒙脱石](#) [穿透曲线](#) [HYDRUS-1D](#)

基金项目: [国家科技支撑计划项目专题\(No. 2006BAD09B04\)](#); [西北农林科技大学科研专项\(No. 07ZR044\)](#); [西北农林科技大学博士科研启动基金\(No.2010BSJJ072\)](#)

作者 单位

- 孙慧敏 1. 西北农林科技大学资源环境学院,杨凌 712100;  
2. 农业部黄土高原农业资源与环境修复重点开放实验室,杨凌 712100
- 殷宪强 1. 西北农林科技大学资源环境学院,杨凌 712100;  
2. 农业部黄土高原农业资源与环境修复重点开放实验室,杨凌 712100
- 王益权 1. 西北农林科技大学资源环境学院,杨凌 712100;  
2. 农业部黄土高原农业资源与环境修复重点开放实验室,杨凌 712100

**摘要:** 环境pH值条件的变化是影响土壤胶体运移的重要因素之一.本文选取土壤体系中常见的两种不同结构类型的粘土矿物胶体高岭石和蒙脱石作为主要实验材料,通过室内模拟实验和数学模型分析的手段,分别研究了不同pH值条件下,两种无机胶体在多孔介质中的迁移规律.结果表明:高岭石胶体受溶液的pH条件影响强烈,随着pH的变化, $\xi$ 电位及颗粒粒径大小发生明显变化,不同的pH条件下的穿透曲线差异明显.在酸性条件下,高岭石胶体回收率显著降低,而蒙脱石胶体基本不受pH影响;利用HYDRUS-1D模型拟合结果与测定数据之间非常匹配,说明利用该模型模拟饱和条件下胶体在多孔介质中的迁移完全可靠.

**Abstract:** The pH is an important factor which affects the transport of colloids. Kaolinite and montmorillonite were common types of experimental materials in soil with different structural clay minerals. By indoor simulation and mathematical model analysis, this paper investigated the migration mechanism of two types of inorganic colloids in porous media with different pH conditions. The results showed that the transport of kaolinite colloid was affected by pH dramatically. The  $\xi$ -potential and particle size varied significantly with the varied pH, with significantly different breakthrough curves under different pH conditions. In acidic condition, the recovery rate of kaolinite colloid was significantly reduced, while the pH had no influence on that of montmorillonite colloid. It was reliable to simulate colloid transport in saturated porous media model by HYDRUS-1D model, and the simulated data had significant or remarkably significant correlation with the measured data.

**Key words:** [pH](#) [kaolinite](#) [montmorillonite](#) [breakthrough curve](#) [HYDRUS-1D](#)

摘要点击次数: 719 全文下载次数: 676

[关闭](#)[下载PDF阅读器](#)

您是第3656787位访问者

主办单位: 中国科学院生态环境研究中心

单位地址: 北京市海淀区双清路18号 邮编: 100085

服务热线: 010-62941073 传真: 010-62941073 Email: [hjkb@rcees.ac.cn](mailto:hjkb@rcees.ac.cn)

本系统由北京勤云科技发展有限公司设计