

研究报告

蛭石和蒙脱石对Sr的吸附性能

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摘要 研究了蛭石、蒙脱石对Sr的吸附行为及各种实验条件对吸附的影响。结果表明, 在室温下, pH=8, 初始浓度 $C_0=20$ MBq/L的 Sr^{2+} 溶液, 保持液固比为50:1(mL:g)不变时, 蛭石和蒙脱石对 Sr^{2+} 的去除率分别达96.8%和98.5%; 在相同条件下, 其适宜吸附的pH范围均为3~10, 吸附平衡时间分别为2 h和15 min; Ca^{2+} 对蛭石和蒙脱石的吸附影响均较大; 而2 mol/L HNO_3 能分别将82.7%和98.7%的 Sr^{2+} 从蛭石和蒙脱石上解吸下来。蛭石经 $[Ag(NH_3)_2]^+$ 和1 mol/L HCl改性, 吸附率有所提高, $[Cu(NH_3)_4]^{2+}$ 的改性能提高蒙脱石的吸附性能; 高温改性却使蛭石和蒙脱石的吸附性能变得更差。此外, 还用X衍射分析谱(XRD)对改性前后的蛭石和蒙脱石进行了解析, 并初步分析了改性后蛭石和蒙脱石吸附性能发生变化的原因。

关键词 蛭石 蒙脱石 Sr^{2+} 吸附

分类号

Adsorption of Strontium by Vermiculite and Montmorillonite

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Abstract

The adsorption of Sr^{2+} by vermiculite and montmorillonite and the effects of experimental conditions were investigated. The results show that more than 96.8% and 98.5% of the total Sr^{2+} can be adsorbed by the vermiculite and montmorillonite from pH=8 Sr^{2+} solution of 20 MBq/L (C_0) at room temperature, respectively. The equilibrium of adsorption by vermiculite and montmorillonite was achieved within 2 h and 15 min severally, and the optimum pH both ranged from 3 to 10. More than 82.7% and 98.7% Sr^{2+} can be desorbed by 2 mol/L HNO_3 solution from the vermiculite and montmorillonite. The adsorption rate of Sr^{2+} by vermiculite and montmorillonite will decrease in presence of coexistent Ca^{2+} , while modified by $[Ag(NH_3)_2]^+$ and 1 mol/L HCl can improve the adsorption abilities of vermiculite for Sr^{2+} , but decreased by high temperature. As for montmorillonite, modified by $[Cu(NH_3)_4]^{2+}$ can improve adsorption, however, by $[Ag(NH_3)_2]^+$ and high temperature can decrease. Additionally, the modified vermiculite and montmorillonite were analyzed by X-ray diffractometer system (XRD). The results show that the spectra of the modified vermiculite or montmorillonite are different from that of the original one.

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Key words

[vermiculite](#) [montmorillonite](#) [Sr²⁺](#) [adsorption](#)

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