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蒙脱石、高岭石、伊利石对重金属离子吸附容量的实验研究

An Experimental Study of Adsorption Capacity of Montmorillonite, Kaolinite and Illite for Heavy Metals

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中文关键词: 蒙脱石 高岭石 伊利石 重金属 吸附容量

英文关键词: montmorillonite kaolinite illite heavy metals adsorption capacity

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中文摘要:

在pH=4,t=23℃和微量浓度条件下,不改变离子浓度,通过增加吸附液体积进而增加体系中重金属离子含量的方法进行了蒙脱石、伊利石、高岭石对Cu2+、Pb2+、Zn2+、Cd2+、Cr3+等重金属离子吸附容量的实验研究,结果表明,3种矿物吸附容量大小顺序为:蒙脱石>伊利石>高岭石,与其阳离子交换容量密切相关。Cu-蒙脱石和Cr-蒙脱石的X射线衍射结果表明,Cu2+、Cr3+通过离子交换作用进入了蒙脱石的层间。同一矿物对不同重金属离子也有不同的吸附容量:蒙脱石Cr3+>Cu2+>Zn2+>Cd2+>Pb2+;高岭石Cr3+>Pb2+>Zn2+>Cu2+>Cd2+;伊利石Cr3+>Zn2+>Cd2+>Cu2+>Pb2+。

英文摘要:

The experimental study on the adsorption capacity of montmorillonite, kaolinite and illite for Cu2+,Pb2+, Zn2+, Cd2+and Cr3+was conducted under the conditions of pH=4,t=23℃and very low concentrations of heavy metals. In this study, some means were used for the purpose of keeping the original concentrations of heavy metals unchanged and increasing the amount of heavy metals by adding heavy metals_bearing solution into the reaction systems. The adsorption capacities of the three clay minerals for the five heavy metals are found to be in order of montmorillonite > illite > kaolinite. Their adsorption capacities are mainly controlled by their CEC. XRD results of Cu_montmorillonite and Cr-montmorillonite show that Cu2+and Cr3+have entered the interlayer of montmorillonite by cation exchange with Ca2+. Also, adsorption capacities of each mineral are different for different heavy metals: the adsorption capacities of montmorillonite, kaolinite and illite for different heavy metals are in order of Cr3+>Cu2+>Zn2+>Cd2+>Pb2+, Cr3+>Pb2+>Zn2+>Cu2+>Cd2+and Cr3+>Zn2+>Cd2+>Cu2+>Pb2+respectively.

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