

化学

土壤腐殖酸的提取及其对U(VI)的吸附

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摘要 用稀碱法从拟作为核废物埋场的土壤中提取腐殖酸并用元素分析和红外光谱进行表征。用此腐殖酸对U(VI)进行的吸附实验结果表明: 当U(VI)初始总浓度为 0.84×10^{-4} mol/L、溶液pH为3时, 5 mg腐殖酸可从20 mL溶液中吸附U(VI) 80%以上; 两相接触8 h后达到动态平衡; 水相U(VI)浓度与吸附量之间的关系符合Langmuir经验公式; 在0~40 °C范围内, 温度对吸附有不大的正影响; Al^{3+} 、 Ca^{2+} 、 Nd^{3+} 、 Eu^{3+} 、 CO_3^{2-} 、柠檬酸根离子、 SO_4^{2-} 和EDTA等能使该腐殖酸对U(VI)的吸附率显著降低, 而 K^+ 、 NO_3^- 等对吸附则无明显影响。

关键词 [土壤](#); [腐殖酸](#); [提取](#); [吸附](#); [U\(VI\)](#)

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Adsorption of U(VI) by Humic Acid Extracted From Soil

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Abstract Humic acid (HA) was extracted from the soil by using the procedure recommended by International Humic Substance Society (IHSS) with minor modifications. It was characterized by the element analysis and the IR spectra. Then the adsorption behaviors of U(VI) on the extracted HA were investigated by the static experimental method. The results show that more than 80% of the total U(VI) can be adsorbed by 5 mg humic acid at pH=3 from 20 mL aqueous solution of 0.84×10^{-4} mol/L U(VI) and the adsorption is increased with increasing pH in the range of 1-3 and decreased with increasing pH in the range of 3-10. The relationship between the concentration of U(VI) in aqueous solution and the adsorbed U(VI) is in accord with the Langmuir equation in the U(VI) concentration range from 10^{-6} to 10^{-4} mol/L. In the presence of Al^{3+} , Ca^{2+} , Nd^{3+} , Eu^{3+} , CO_3^{2-} , SO_4^{2-} , citric acid and EDTA, the adsorption of U(VI) on the humic acid is decreased relative to that in the absence of these ligands and bivalent and trivalent cations, while the effects of K^+ and NO_3^- are insignificant. The effect of temperature in the range of 0-40 °C on the adsorption of U(VI) was investigated.

Key words [soil](#) _ [humic acid](#) _ [extraction](#) _ [adsorption](#) _ [U\(VI\)](#)

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