

化学

极低放废物填埋场土壤对U、Sr的吸附及影响

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摘要 为了解U、Sr在极低放废物预选场址土壤中的吸附行为, 分别以²³⁸U和⁹⁰Sr溶液为示踪剂, 用静态吸附法测定吸附分配系数, 并研究pH、共存离子、胶体等条件的影响。研究表明: 场址土壤对U、Sr的最大分配系数分别为11 300和723 mL/g; U、Sr的吸附均符合Freundlich等温吸附方程; 当pH为 4~8时, 铀的吸附分配比最大, 而锶的分配系数最小; Ca²⁺和Mg²⁺的引入均能降低土壤对U、Sr的吸附, 且对Sr的影响大于对铀的影响; 在CO₂-³和C₂O₂-⁴浓度很低时, 能显著降低U的吸附分配系数; 而CO₂-³的存在能够增大其对Sr的吸附; Fe(OH)₃胶体的存在使U、Sr的吸附分配系数显著降低; 腐殖酸(HA)的存在使土壤对U的吸附减弱, 但能够增大Sr在土壤中的吸附。

关键词 [极低放废物](#); [土壤](#); [吸附](#); [U](#); [Sr](#); [腐殖酸](#)

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Adsorption and Effect of Very Low-Level Radioactive Waste Site Soil on U and Sr

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Abstract The adsorption behaviors of uranium and strontium were investigated on soil of very low-level radioactive waste (VLLW) in a preselection site by the static experimental method. The effects of the various experimental conditions such as pH, coexist iron and colloid on the adsorption were investigated with the ²³⁸U and ⁹⁰Sr as indicator respectively. The maximum adsorption distribution coefficient (K_d) of U and Sr on the site's soil are 11 300 and 723 mL/g, respectively. The concentration relationship in aqueous solutions and the adsorption capacities of U and Sr can be described by the Freundlich adsorption equation. The K_d of U is maximum when the pH is 4-8, however, the K_d of Sr is minimal. It is also noted that the K_d of U and Sr drops obviously when the solution contains Ca²⁺ or Mg²⁺, even the influence on Sr is more than U. The K_d of U reduces remarkably when adding in CO₂-³ or C₂O₂-⁴, but the K_d of Sr increases. The ferric hydroxide colloid would make the K_d of U and Sr drop. The K_d of U decreases while the K_d of Sr increases when the humic acid exists in solution.

Key words [very low-level radioactive waste](#) [soil](#) [adsorption](#) [U](#) [Sr](#) [humic acid](#)

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