

Controlled Crystal Sizes and Mesoporosity of LTA Zeolites for Selective Removal of Sr²⁺ in Seawater

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Zeolites are microporous, aluminosilicate materials that can be utilized for catalysts, separating materials, and ions adsorption. In this study, we used LTA zeolites with controlled sizes and mesoporosity for the removal of cationic radioactive elements such as Sr²⁺ through the ion-exchange process. To elucidate the effects of crystal size and mesoporosity, we prepared various microporous LTA zeolites with 100 nm, 500 nm, 2 μm, and mesoporous 2 μm by controlling the synthesis process. All samples are ion-exchanged with sodium ions before the adsorption study. All experiments conducted under seawater conditions, but only kinetic studies of LTA conducted under artificial Sr²⁺ solution. The adsorption study and kinetics study for Sr²⁺ from seawater using the LTA zeolites demonstrated that the different crystal size and mesoporosity gave a significant influence on the adsorption performances, and kinetics of Sr²⁺ using LTA zeolites followed the Lagergren 2nd-order model. Detailed discussion on adsorption results is going to be demonstrated in the poster.