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Evaluating Commercial Macroporous Resin (D201) for Uranium Uptake in Static and Dynamic Fixed Bed Ion Exchange Column

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ABSTRACT

As part of the development of equipment and innovative technology for the process flow-sheet, a study on the selection of good resin for uranium uptake is ongoing. Both static and dynamic column equilibrium testing upon synthetic and Gattar pregnant leach solutions (PLS) were carried out to estimate the change of total capacity and breakthrough capacity of the commercial macroporous anion exchange resin (D201). Applying the static and dynamic methods upon synthetic uranium sulphate solution, the maximum adsorption capacity of uranium (VI) upon D201 resin was evaluated to be 105 and 101.2mgU/g respectively. The macroporous D201 resin has been found to agree with the Langmuir isotherm. Finally, the optimized factors have been carried out for uranium recovery from Gattar pregnant leach solution, under the optimized working conditions, about 93 and 90 % of the resin theoretical capacity was realized using both static and dynamic techniques respectively.

Keywords: Uranium, Adsorption, Breakthrough, D201resin, Gattar

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