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Application of chelating weak base resin Dowex M4195 to the recovery of uranium from mixed sulfate/chloride media

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Abstract

The use of untreated seawater or bore water in uranium mineral processing circuits may represent a cheaper and more sustainable water resource for Australia's mining operations. Using present technologies, the increased salinity from these water sources results in decreased uranium extraction and increased extraction of impurities. There is incentive to overcome these challenges, either through new technologies, or repurposing existing technologies. The ion exchange behaviour of U from sulfate media on the weakly basic chelating resin Dowex M4195 (bis-picolylamine functionality) and the effect of competing chloride and impurity metal ions (Th, Fe, Al, Cu, Ni) has been studied. Experiments to determine acid, and sulfate media behaviour, and extraction thermodynamics including the effect of increasing chloride concentration upon extraction behaviour were carried out.