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# The Sorption of Tc(IV) to some Clay Minerals

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Tc-99 is one of the most important isotopes likely to be disposed of in the proposed UK Geological Disposal Facility for higher-activity radioactive wastes, due to its long half-life, high fission yield and ability to migrate through the geosphere as the pertechnetate ion. However, much of the technetium is likely to be in the lower oxidation state of Tc(IV) due to the low Eh in the near field. Batch sorption experiments across the pH range have been performed on Tc(IV) using Tc-95m as a spike in the presence of some representative clay minerals (bentonite, smectite, kaolininte, montmorillonite and illite).Tc(IV) solutions were used at trace concentrations to avoid precipitation as technetium dioxide. Values for the partition coefficient (Rd) were found to range from 7 to 2e5 mL/g. Rd was heavily dependent on pH in all cases, with the highest values being found in the circumneutral area. These data will inform the performance assessment for the behaviour of technetium in the near-field of the UK's planned higher-activity wastes GDF. Surface complexation modelling of the data has been performed.

**Primary authors:** EVANS, Nicholas D. M. (NTU); Dr EVANS, Nick (NTU)

**Presenter:** EVANS, Nicholas D. M. (NTU)

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