

LEACHING OF SYNROC IN D₂O

E.R Vance, N. Dytlewski, B.D.Begg, K Prince and G. J. Thorogood,

Materials Division, ANSTO, Menai, NSW 2234.

Fax: (02) 543 7179

Email: erv@nucleus.ansto.gov.au

The use of D₂O rather than H₂O for leaching Synroc and its constituent phases allows the study of hydration and hydroxylation reactions without the contaminating influence of atmospheric moisture. For Synroc leached at 190°C for 5-30 days, the penetration of D into the Synroc is found as ~30 nm from both energy recoil analysis using 1.5 MeV He ions from a Van de Graaff accelerator and secondary ion mass spectroscopy near mass 18(OD⁻).

Analogous studies have been carried out on single crystals of SrTiO₃ which have the perovskite (a constituent phase of Synroc) structure, and augmented by additional atomic force and scanning electron microscope studies of secondary TiO₂ alteration products. Alteration products on single crystals of CaTiO₃ have also been studied.