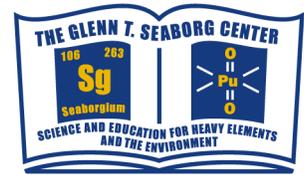




# Glenn T. Seaborg Center Seminar



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## **Impact of Spent Fuel Alteration Phases on Neptunium Mobility in Yucca Mountain**

**Wednesday, October 1, 2003**

**4 pm**

Building 70A-3377

Spent nuclear fuel is unstable under the moist oxidizing conditions expected in the proposed geological repository at Yucca Mountain. Incorporation of radionuclides into the uranyl phases that will form due to alteration of spent fuel may significantly reduce radionuclide mobility in the repository, but this scenario is not included in current performance assessment models for Yucca Mountain. The potential impact of uranyl minerals on the mobility of Np-237, which is one of the most important radionuclides for long-term repository performance, is being studied by synthesis of uranyl phases in contact with solutions containing 10 to 500 ppm Np(V). The impacts of time, temperature, pH and counter-ions on Np incorporation are being addressed. Analysis of crystals using X-ray absorption spectroscopy (XAS), conducted at APS with a bent-Laue analyzer crystal to separate the signal of Np from that of U, and by ICP-AES (U, Na, Ca) and ICP-MS (Np), have established that incorporation of Np into uranyl phases is likely to significantly impact repository performance.

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