

Developments in Plutonium Recovery at AWE

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Aqueous plutonium recovery is a critical component of the plutonium lifecycle, enabling the UK to maintain responsible stewardship of its plutonium inventory by returning recoverable material to the product stream. Over time, a diverse range of plutonium-bearing residues accumulates from machining, pyro-processing, and analytical operations. Identifying efficient, robust, and optimised methods for recovering plutonium from these residues is therefore essential for closing the material management loop.

AWE and NNL are currently undertaking a coordinated programme of experimental work to generate the data required to inform the design of a future plutonium recovery facility. Ongoing studies include determining optimum dissolution conditions for chloride and non-chloride residues in nitric and hydrochloric acid, evaluating salt-washing strategies, and assessing ion-exchange resin performance to establish achievable decontamination factors. Additional research focuses on precipitation processes—specifically plutonium oxalate to understand product yield and decontamination behaviour. Work is also progressing on final waste encapsulation and long-term storage approaches.

This presentation will outline the latest findings from these activities and highlight future research and development priorities in aqueous plutonium recovery at AWE.