



Cost and System Analysis of Innovative Fuel Resources Concepts

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Collaborators: N/A

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ABSTRACT:

Fostering the development of technologies to effectively recover uranium from seawater is a major focus area for the Fuel Resources Campaign. To that end, a team led by Oak Ridge National Laboratory (ORNL) and supported by Pacific Northwest and Lawrence Berkeley National Laboratories is developing and testing braided polymer fiber adsorbents that surpass the sorption capacity, selectivity and durability of the best existing technology. The work led by ORNL builds upon a polymer substrate, grafting process and deployment concept pioneered in Japan. By increasing the surface area of the adsorbent fibers and improving the amidoxime-based ligand grafting process to, among other enhancements, improve the hydrophilicity of the adsorbent, the ORNL-led team has roughly doubled the uranium uptake when compared to the Japanese design.

This work will provide ongoing system (cost and EROI) analyses for three to six of the NEUP projects. While the 2011 NEUPs were used here as examples since they are farthest advanced, the 2012 and forthcoming 2013 NEUPs would also be candidates later in our proposed 3-year performance period. Some of the NEUPs will not be suitable (e.g. if there is a focus on computational ligand design and thermodynamics modeling, as was the case for one of the 2011 NEUPs), and others may be immature from the perspective of either the NEUP PI or the DOE sponsor. Therefore, the NEUPs to be augmented by system analysis will be selected by the DOE Program Manager and Campaign Director in consultation with the respective NEUP PIs.