

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Advanced Electrochemical Separations of Actinide/Fission Products via the Control of Nucleation and Growth of Electrodeposits – University of Idaho

SECTION B. Project Description

The University of Idaho proposes to find ways to preclude the formation of electrodeposits with dendritic morphology for use in the pyrochemical reprocessing of spent nuclear fuels. The objectives of the proposed research are to:

1. Study the morphology (nucleation and growth) of electrodeposits as a function of additives to molten LiCl-KCl electrolyte, such as thermally stable ionic liquids and lubricants.
2. Search for technically acceptable and chemically functional additives to the LiCl-KCl molten salts that will place the electrodeposition of actinides and fission products in the active region.
3. Redesign the electrochemical molten salt cell for use of distinct cathodic and anodic compartments, and reexamine the fundamental results obtained in one-compartment cell.

SECTION C. Environmental Aspects / Potential Sources of Impact

Chemical Use/Storage / Chemical Waste Disposal – The amounts used and waste produced is very small per each experiment, about 20 grams. Also, these are solid salts which are liquid at experimental temperature but turn solid upon cooling. The solid waste will be collected with time and stored in a metal container. At the end of the project the University of Idaho waste disposal office will come for pickup. Total amount that would be generated is estimated at about 4-5 pounds. Major components of the salt are lithium chloride and potassium chloride.

SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not “connected” nor “related” (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B3.6 Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial development.

Justification: The activity consists of university-scale research aimed at investigating the formation of electrodeposits with dendritic morphology for use in the pyrochemical reprocessing of spent nuclear fuels.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on 09/21/2016