# DOE-ID NEPA CX DETERMINATION



CX Posting No.: DOE-ID-20-076

**SECTION A. Project Title: Investigation on multicomponent solubility in eutectic (LiCl-KCl) chloride salts using combinatorial approach**

**SECTION B. Project Description**

The University of Idaho proposes to develop understanding of multicomponent fission products behavior in eutectic (LiCl-KCl) chloride salts for pyroprocessing technology. Four-component chloride salt systems with two of the most representative fission products including CeCl3, LaCl3 and NdCl3 in the eutectic LiCl-KCl salt will be investigated at the temperature range of 723 K to 823 K. This research will experimentally establish solubility data as a function of temperature and salt composition and to provide a comprehensive understanding of the solid-liquid equilibria in complex chloride systems by combining thermodynamic assessments of these chloride systems and experimental measurements. The university will design and perform experiments for measuring solubility of multicomponent fission product chlorides in eutectic salts comprising two lanthanides components in eutectic salt systems

**SECTION C. Environmental Aspects / Potential Sources of Impact**

Chemical Use/Storage, Chemical Waste Disposal: Chemicals used will be eutectic chloride salt mixtures. University protocols will be followed for proper disposal.

**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 activities to develop understanding of multicomponent fission products behavior in eutectic chloride salts for pyroprocessing technology.

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

Approved by Jason Sturm, DOE-ID NEPA Compliance Officer on 8/6/2020