DOE-ID NEPA CX DETERMINATION

CX Posting No.: DOE-ID-16-038

SECTION A. Project Title: Feasibility of Combined Ion-Neutron Irradiation for Accessing High Dose Levels – Florida International University

SECTION B. Project Description

Florida International University, in collaboration with the Idaho National Laboratory (INL), proposes to achieve the separation of Am from lanthanides by electrochemical oxidation of Am(III) to its higher oxidation states, Am(V) and AM(VI), through the design, and testing of new high surface area electrodes and porous sorbent materials.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use – Research will be conducted with 243Am. It will be limited to use within a fumehood or glovebox designated for radioactive work, with appropriate work controls in place. For any given experiment, concentrations will be kept below 2 mM, with total volumes not exceeding 5 mL. Personal protective equipment will be worn, while Personal surveys will be conducted using Geiger counter meters measuring both α, and β/γ probes to ensure that no radioactive material is contained within the fumehood or glovebox, and any material found outside is appropriated decontaminated. Exiting a radiological buffer area will require personnel to enter a personnel monitor to more fully determine if any contamination is located on the researcher. Protocols associated with the safe use of radioactive materials at INL will be followed. No Am will be used at FIU. When necessary, we may perform surrogate work with Uranium within a hot-facility at FIU designed for radioactive work, with appropriate work controls in place.

Radioactive Waste Generation – Research will be conducted with 243Am. It will be limited to use within a fumehood or glovebox designated for radioactive work, with appropriate work controls in place. For any given experiment, concentrations will be kept below 2 mM, with total volumes not exceeding 5 mL. Personal protective equipment will be worn, while Personal surveys will be conducted using Geiger counter meters measuring both α, and β/γ probes to ensure that no radioactive material is contained within the fumehood or glovebox, and any material found outside is appropriated decontaminated. Exiting a radiological buffer area will require personnel to enter a personnel monitor to more fully determine if any contamination is located on the researcher. Protocols associated with the safe use of radioactive materials at INL will be followed. No Am will be used at FIU. When necessary, we may perform surrogate work with Uranium within a hot-facility at FIU designed for radioactive work, with appropriate work controls in place.

Chemical Use/Storage – Chemicals including solvents and electrolytes will be used for studies involving electrochemistry and spectroscopy. These include nitric acid, methanol, and electrolytes such as sodium nitrate. Additionally, synthesis of compounds for surface derivatization will be used. Compound and precursors will be stored and used as necessary. These include a variety of organic materials, as well as inorganic salts. Chemicals will be used and stored at FIU, UNC-CH, and INL.

Chemical Waste Disposal – During the course of compound synthesis and testing liquid waste will be generated. This includes organic solvents mixed with organic precursors. These will be disposed of according to Environmental Health and Safety protocols in place at FIU.

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 on Americium Separation by electrochemical oxidation.

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on 06/30/2016