

Subject: Safety Issues for the Separations of La/Ac from Th and Other Materials

Present: Lessard, Edward T. (chair for meeting); Ryan, Dennis J.; Mausner, Leonard; Cirnigliaro, Peter P.; Fitzsimmons, Jonathan; Karol, Raymond C.; Schaefer, Charles W.; Medvedev, Dmitri; Garza, Maria; Muench, Lisa; Goldberg, Anna; Pile, Philip H.

The committee reviewed a presentation made by Jonathan Fitzsimmons regarding the scope and nature of the separations experiments to be performed in the radioactive-chemical processing laboratories at Building 801.

Experiment

J. Fitzsimmons led the discussion¹ with a PowerPoint presentation. The experimental work occurs in Building 801 laboratories in RRPL. Thorium with metal spikes and Th with Ac-225 and metal spikes will undergo complexing, rinsing and elution using chelating agents and cation exchange resin. The natural Th is an alpha emitter and low energy photon emitter. It is difficult to detect once it is inhaled. The Ac-225 is an alpha emitter and has an easier to detect photon from the decay of a short-lived daughter. About 0.011 mCi of Th (100 grams) and 1 mCi of Ac-225 will be available for experiments.

Experiment Details

J. Fitzsimmons provided a detailed write up² of the following topics:

1. Scope of Experiment
2. Chemistry Notes (Phases of the Experiments)
3. Apparatus Used
4. Facility Modification (Use of a Glove Box)
5. Hazards and Controls
6. Waste
7. Training and Requirements for Workers

Experiment Action Items

1. Jonathan Fitzsimmons presented the description of the experiment, the hazards and the controls.
 - a. **Action Item:** Jonathan Fitzsimmons will send Power Point presentation to RSC

¹ J. Fitzsimmons, "[Safety Issues for the Separations of La/Ac from Th and Other Materials](#)", Feb. 13, 2015

² J. Fitzsimmons, [Experiment Details](#)

2. Jonathan Fitzsimmons will work with Th nitrate; **100 grams Th nitrate in Building 801 is the RSC limit.** Up to 50 grams may be in process; typically, at the start of the experiments, 2 grams will be in process.
3. Ac-225 will also be used; **1 mCi Ac-225 is the RSC limit for Building 801;** typically 0.1 mCi Ac-225 will be in process
 - a. **Action Item:** Jonathan Fitzsimmons will log and track the two limits in his logbook
 - b. **Action Item:** Jonathan Fitzsimmons will send a list of radionuclide impurities, if any, that come with Ac-225
4. HF will not be used
5. Th metal will not be used
6. Separations experiments will be done in a glove box in a hood
7. HEPAs are new for glove box but glove-box filters are not tested
8. HEPA filters in hood are tested and currently pass the tests
 - a. **Action Item:** Jonathan Fitzsimmons may need waiver for hood face velocity because of glove box interference; glove box may need to be raised up to get satisfactory face velocity; Peter Cirnigliaro will get waiver for hood face velocity if needed and allowed
 - b. **Action Item:** Nick Contos will check the status of the hood filters to ensure they are operational and in compliance
9. Liquid waste from each experimental run, about 1 liter, could be solidified; however, liquid Th and Ac-225 radioactive waste can go to D Waste as reported to Leonard Mausner by Mike Clancy at Waste Management Division.
 - a. **Action Item:** sink to D Waste will be plugged by Jonathan Fitzsimmons when not in use
 - b. **Action Item:** Nick Contos will check the sink draw for air flow into D waste using a smoke test; all sink drains should be checked for draw
10. There are written procedures on radioactive materials transfers in the building; an RWP covers allowable dose rates when moving materials to and from ICP/gamma spec testing area
11. Nick Contos reports sensitive alpha survey equipment is available
12. It was stated that ICP testing is not going to put Sr-82 program schedule at moderate or high risk
 - a. **Action Item:** Jonathan Fitzsimmons will check and maintain spares on tubing for ICP should it be necessary to replace
13. Experiment requires continuous but not constant HP coverage; Nick Contos reports they are experienced in handling spills
 - a. **Action Item:** HP will do portable air sampling when Jonathan Fitzsimmons is experimenting with Th and no other radioactive materials such as Ac-225 or La-140 are involved
 - b. **Action Item:** Nick Contos Nick Contos will write up an RWP for the overall experiment HP controls and required PPE
14. **Action Item:** Peter Cirnigliaro will represent the RSC when the ESRC walk through is performed and ensure the experiment is ready, as per above action items

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