

Synthesis of Actinide Molten Salt Fuel

Dawn Woods - Research Scientist

Objective

- A supply of actinide salts will be required for many future molten salt research activities in Canada.
- This project seeks to develop an effective process for the synthesis of actinide salts (chlorides and fluorides) from oxides.

Federal Stakeholders

- Canadian Nuclear Safety Commission

Previous Work

Two inert atmosphere, negative pressure gloveboxes were purchased and installed for molten salt work.

Upcoming work

- Commission new test facility

Results

- Literature review of synthesis methods for actinide chlorides has been completed
- Experimental proposal for synthesis of U, Th and Pu chlorides is complete
- Equipment has been purchased

Overview of Chloride Experiments

- Conversion of UO_2 to U_3O_8 , ThO_2 to Th oxalate and PuO_2 to Pu oxalate
- Chlorination using hexachloropropene
- Filtration and washing
- UCl_4 reduced to UCl_3 through reaction with metallic zinc

Future years

- Conduct experiments to produce salts
- Characterize produced salts



Figure: Inert atmosphere glovebox for molten salt fuel synthesis

