RadChem 2022



Contribution ID: 884

Type: Verbal

## STUDIES IN DUAL DOPING OF URANIUM NITRIDE FOR USE AS ADVANCE TECHNOLOGY FUELS

Friday, 20 May 2022 09:08 (18 minutes)

Uranium Nitride (UN) is a potential candidate for the advanced technology fuels (ATF) concept, as it has numerous benefits compared to conventional uranium oxide (UO2) used today. Namely, higher thermal conductivity and uranium density. UN main drawback is its poor corrosion resistance in oxidizing environments. Doping of UN with oxide scale forming elements such as chromium could improve the resistance towards oxidation. In this work, the addition of chromium and aluminum in the UN matrix was accomplished using a sol-gel method to obtain a homogenous mixture of the metals. The effect caused by the introduction of these dopants in the properties of the UN material was studied. It was observed that addition of aluminum caused a change in the microstructure of the spheres. These changes are suspected to be responsible for the decrease in the reaction temperatures needed to oxidize the UN with air during the thermogravimetric analysis. Chromium content appeared to decrease during the synthesis of UN. Nonetheless, oxidation temperatures were increased only when chromium alone was added as dopant.

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Session Classification: Nuclear Fuel Cycle

**Track Classification:** Chemistry of Nuclear Fuel Cycle, Radiochemical Problems in Nuclear Waste Management