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TMS2024
153rd Annual Meeting & Exhibition

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HYATT REGENCY ORLANDO
ORLANDO, FLORIDA, USA
#TMSAnnualMeeting



SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2024 SYMPOSIUM:

NUCLEAR MATERIALS

Ceramics and Ceramic-based Composites for Nuclear Fission Applications

Ceramics and ceramic-based composites play an important role in nuclear industry as they can be used to generate nuclear power and dispose of radioactive nuclear waste. For instance, nuclear graphite has been used widely in gas-cooled reactors, either in prismatic designs or pebble-bed configuration, as a fast-neutron moderator as well as structural components.

Graphite composites and SiC-based ceramics are also used as matrix for TRISO fuels (pellets or pebbles). SiC ceramic-matrix composites in tubular shape, on the other hand, have been investigated as an alternative to conventional Zircaloy as accident tolerant fuels. Lastly, ceramics, such as borosilicate glass, are also adopted in the immobilization/storage of nuclear waste.

The nano-/micro-structure and the thermal/mechanical properties of these materials evolve with irradiation in service, and it is critical to understand the underlying mechanisms via experimental and modelling methods. It is therefore essential that a symposium brings together experts/scientists across the world to share knowledge and experience on these materials to inspire novel and transformative ideas.

The primary topics of interest to this symposium are:

- Fuels: UO₂, UCO, MOX, and TRISO (stand-alone particles or embedded in graphite or SiC matrix)
- Nuclear graphite: reactor core components or as matrix material for TRISO
- Waste management: borosilicate glasses and other relevant materials
- Experimental characterization: microstructural evolution, degradation behaviors
- Properties: thermal and mechanical properties
- Modelling of ceramic degradation mechanisms and properties

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