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TMS 2024

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

Irradiation Testing: Facilities, Capabilities, and Experimental Designs

Irradiation testing is integral to the development and acceptance of materials and components intended for radiation environments. Irradiation testing addresses a broad array of concerns ranging from the validation of models describing irradiated material behavior to providing proof-of-concept information to justify further development by industry or acceptance by regulatory authorities.

Nuclear energy production frequently drives the need for developing materials with enhanced irradiation performance. Current material development efforts include those intended for established reactor designs as well as those being considered for use in either fusion or advanced reactor concepts. Outside the reactor, additional structures, such as those in spent fuel pools and storage casks, must also withstand the challenges posed by long-term exposure to radiation during subsequent spent fuel handling, storage, and disposal. Beyond energy production, irradiation testing can also help develop and refine isotope production processes as well as shielding requirements.

These efforts support a wide array of applications ranging from medical diagnostics and scientific research to enhancing worker safety and prolonging space exploration missions, respectively. Irradiation testing is clearly a critical aspect of material development, and a wide array of test capabilities are required.

The aim of this symposium is to highlight facilities with irradiation testing capabilities that enable data collection from materials exposed to neutron, proton, ion, or gamma irradiation. Topics of interest for this symposium include irradiation vehicle design, in-situ monitoring and control, irradiation facility capabilities, experimental design, and post-irradiation examination capabilities.

Test vehicle designs used to support drop-in or instrumented lead experiments in materials research reactors are of interest as well as the experimental configurations used to facilitate beamline irradiations. Active and passive methods of monitoring and controlling key parameters, such as temperature and flux, are also of interest.

Finally, methods of obtaining data from experiments either during irradiation (e.g., in-situ data collection) or from post-irradiation examination are also of interest. This symposium is intended to bring together national laboratory, university, and nuclear industry researchers from around the world to discuss the current capabilities and challenges associated with the design and execution of irradiation experiments.

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