



Contribution ID: 15

Type: **Poster**

## IMMOBILIZATION OF RARE EARTH WASTE STREAM FROM REPROCESSING USING VITRIFICATION

*Thursday, 27 June 2019 10:45 (15 minutes)*

Rare earth (RE) oxides are one of the waste streams generated during pyroprocessing of spent nuclear fuel. To immobilize RE oxides in glass, we explored an international simple glass (ISG), alkali borosilicate glass (ABG) and aluminoborosilicate glass (AG). The loading of RE oxides varied within 15 and 56.5 mass%. To characterize glass durability, we performed the 7-day Product consistency test (PCT), which showed good values for ISG and AG glasses. Crystallinity was investigated using optical microscope and x-ray diffraction (XRD). Various types of crystals were identified: ISG formed RE-borosilicate crystals with a single lanthanide and oxyapatite with a mixture of several RE oxides; ABG formed cerianite; and AG formed cerianite, RE-borosilicate, and Al-containing crystals. We have determined liquidus temperatures for crystals formed as functions of glass composition.

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Yes

### Country or International Organization

Malaysia

**Primary author:** Dr MOHD FADZIL, Syazwani (School of Applied Physics, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia)

**Co-author:** Prof. HRMA, Pavel (Pacific Northwest National Laboratory, P.O. Box 999, Richland, Washington, United States)

**Presenter:** Dr MOHD FADZIL, Syazwani (School of Applied Physics, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia)

**Session Classification:** Track 5 Poster Session

**Track Classification:** Track 5: Impacts of advanced nuclear energy systems on the back-end of the fuel cycle