



ID de Contribution: 44

Type: Poster

Chlorine Incorporation in Iron Phosphate and Borate Glasses for Nuclear Waste Immobilization

lundi 30 mars 2026 13:40 (20 minutes)

Chlorine is a volatile element commonly found in various types of waste, including legacy radioactive waste and waste generated by molten salt reactors. The presence of chlorine in these wastes represents a significant challenge for long-term immobilization, as its vitrification in conventional borosilicate glasses is hindered by the low solubility of chlorine, leading to volatilization losses and potential degradation of the glass matrix.

In this context, iron phosphate glasses have emerged as a promising alternative for nuclear waste immobilization due to their ability to accommodate a wide range of elements and their favorable chemical durability. This study focuses on the mechanisms of chlorine incorporation in $P_2O_5 - Al_2O_3 - Fe_2O_3 - X$ ($X = CaO, Na_2O, SrO$) and $B_2O_3 - Al_2O_3 - Fe_2O_3 - X$ glass systems.

The effects of the nature of alkali and alkaline-earth elements, synthesis routes, and chlorine precursors were systematically investigated in order to enhance chlorine solubility in the glass matrices. The objective is to identify the key parameters governing chlorine incorporation and retention, thereby contributing to the development of durable glass formulations for the immobilization of chlorine-bearing nuclear wastes.

Speaker information

PhD 1st year

Auteur: DAOUD, Yanis

Co-auteurs: VERONNEAU, Cyrille; NEUVILLE, Daniel; CORMIER, Laurent

Classification de Session: Poster

Classification de thématique: Earth and Environment