

2016

Phase transition phenomena in an iron phosphate glass and thermal stability criteria

A.Djeridi, A. Benmounah, N. Kamel, D. Moudir, S.Kamariz, Y.Mouheb

Abstract : The thermal stability of an iron phosphate glass dedicated to radioactive waste confinement is a crucial characteristic for the integrity of the waste package. In this study, we investigate the thermal stability criteria defined by Hruby, Weinberg and Lu/Liu by measuring the glass transition temperature (T_g), the crystallization temperature (T_c), and the melting temperature (T_m) of an iron phosphate glass loaded with radioactive waste. These temperatures decrease when loading the glass with the waste: T_g decreases from 623.48 °C to 580.04 °C, T_c from 766.34 to 679.26 °C and T_m from 932.76 °C to 919.75 °C. Thermal stability criteria show satisfactory values, in the interval 0.14 to 0.69.

Keywords : Iron phosphate glass, Thermal stability, Radioactive waste, XRD, DTA, SEM