
Current technologies nuclear waste vitrification furnaces / Technology and issues

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Abstract

A cold crucible induction melter is in operation in La Hague plant, which is operated by ORANO since 2010 for the vitrification of High-Level-Waste (HLW) arising from decommissioning and dismantling operation and old reprocessing of high Molybdenum content fuel. The well-known advantages of the cold crucible compared to the hot metallic inductive melter are (i) a higher elaboration temperature (ii) an extended lifetime and (iii) a better homogeneity obtained by mechanical stirring and gas bubbling. As a result, the global production capacity is expected to be higher as well as the Platinum Group Metal (PGM) particles concentration in the glass. A part of the development of this technology is made with the help of numerical simulation of the glass flow and heating by direct Joule effect thanks to the high frequency induction power unit. In this paper, the last effort of 3D modelisation of the Platinum-Group-Metals (PGM) particles behavior in the glass and chemical reaction kinetics of the feed are detailed.

Keywords: Cold crucible technology, electric induction heating

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