

Preliminary Test for Actual Corium Melting and Release in Fuel Coolant Interaction Experiment

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Abstract

This paper discusses the results of melting and delivery test using TiO₂ performed at Korea Atomic Energy Research Institute as a part of Fuel Coolant Interaction (FCI) experimental research. The cold crucible technology is employed for the melting to provide pure composition of material and flexibility of operation. The capacity of R.F(Radio Frequency) generator and frequency and the cold crucible dimensions are designed for the preliminary experiment. The capacity of R.F generator is 30kW and the frequency is 370kHz. The cold crucible has dimension of 15cm inner diameter and 30cm height. A preliminary melting test has been successfully performed using about 10kg melting experiment of TiO₂(m. p. : 1865 °C) as a corium simulant. In the melt delivery experiment, about 2.6kg of molten TiO₂ which is 60% of initial charged mass, is released to a sand box from the cold crucible of 15cm in inner diameter and 20cm in height with same R.F generator. The capacity of R.F generator and frequency and the cold crucible dimensions are designed for main test using the UO₂/ZrO₂ mixtures.