

Effect of Nickel Coating on Corrosion of Alloys in Molten Salts

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Abstract : Molten fluoride salts are considered as potential coolants for next generation nuclear plants where the heat can be utilized for production of hydrogen and electricity. Among molten fluoride salts, FLiNaK (LiF-NaF-KF: 46.5-11.5-42 mol %) is a potential candidate for the coolant due to its superior thermophysical properties such as high temperature stability, boiling point, volumetric heat capacity and thermal conductivity. Major technical challenge in implementation is the selection of structural material which can withstand corrosive nature of FLiNaK. Corrosion study of alloys SS 316L, Hastelloy B, Ni-201 was performed in molten FLiNaK at 650°C. Nickel was found to be more resistant to corrosive attack in molten fluoride medium. Corrosion experiments were performed to study the effect of nickel coating on corrosion of alloys SS 316L and Hastelloy B. Weight loss of the alloys due to corrosion was measured and corrosion rate was estimated. The surface morphology of the alloys was analyzed by Scanning Electron Microscopy.

Keywords : corrosion, FLiNaK, hastelloy, weight loss

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