

1. Compatibility study of plasma tempered alumina coating with molten Pb-Li

Abstract

Aluminide coatings such as Fe-Al have been reported as candidate coatings for fusion reactors such as ITER. The previous work reported by Jamnapara et al., JNM (2014) and Jamnapara et al., JNM (2015) indicates the development of a stable Al2O3 film generated over 9Cr steels for protection against Pb-Li corrosion. While a short feasibility test of 1000 hours exposure indicated promising compatibility of the plasma tempered alumina coatings, their compatibility with molten Pb-Li for longer durations and in flowing conditions still needs to be established.

The present activity would thus involve hot dip aluminizing of RAFM steels followed by diffusion heat treatment resulting in formation of Fe-Al diffusion phases and a top alumina film. The coated samples will then be subjected to corrosion against flowing Pb-17Li in the liquid metal loop at IPR. The compatibility testing will done for several hours duration and the resultant samples after exposure will be evaluated for the extent of corrosion and surface degradation using characterization tests (XRD, SEM, weight loss etc.)

**Eligibility:** Only M.E / M.Tech students of Metallurgical Engineering & Materials Science branches can submit their application at following email addresses

[nirav@ipr.res.in](http://?) [Guide e-mail address] and

[project\_ms@ipr.res.in](http://?) [Project coordinator’s e-mail address]

079-23964039/4038 [Guide phone number]