

---

SP-07

## Improved adhesion of SiC thin film deposited onto Hastelloy-X by Ion beam Mixing

Jaewon Park, Youngjin Chun, and Chongwha Chang

Korea Atomic Energy Research Institute

Ion beam mixing was employed in order to improve the adhesion of SiC film deposited onto Hastelloy-X. 50nm thick SiC film was deposited by e-beam evaporative method on the Hastelloy-X substrate, followed by 70 keV N ion bombardment to mix the interfacial region. Prior to the film deposition, the surface of Hastelloy-X was sputtered by 5 keV Ar ion bombardment, aiming at the removal of the surface oxides layers. After ion beam mixing at the interface between the thin SiC film and the substrate, additional 500nm thick SiC film was deposited onto the ion bombarded SiC film. Samples with and without ion beam mixing were immersed in the 98% H<sub>2</sub>SO<sub>4</sub> solution for 1 hour with heating the solution up at 300 °C to see the corrosion behavior. The film in the as-deposited sample was removed during the immersion, while the ion beam mixed sample exhibited no peeling the deposited film off. The mode of the film removal during the corrosion seems to be the crevice corrosion, because we observed the corrosion propagation from the non-deposited metallic surface to the film that flaked-off from the edge of the film. We conclude that the ion beam mixed layer is very resistive to the crevice corrosion attack.