

Enhanced Corrosion Resistance of WC-Co with an Ion Beam Mixed Silicon Carbide Coating

여순목, 박재원

한국원자력연구원

Strong adhesion of a silicon carbide (SiC) coating to a WC-Co substrate was achieved through an ion beam mixing technique and the corrosion resistance of the SiC coated WC-Co was investigated by means of a potentiodynamic electrochemical test. In a 1 M NaOH solution, the corrosion current density of SiC-coated WC-Co after heat treatment at 500°C was about 50 times lower than that for the as-received WC-Co. In addition, the corrosion resistance systematically increases with increasing the SiC coating thickness. On the other hand, for a 0.5 M H₂SO₄ solution, the corrosion current density for SiC-coated WC-Co was about 3 times lower than that for the as-received WC-Co. We discuss the physical reasons for the changes in the corrosion current density with the different electrolytes.

Keywords: Corrosion resistance, Ion beam mixing, potentiodynamic electrochemical test