OXIDATION BEHAVIOR OF TWO-PHASE (γ’+β) Ni-Al COATINGS DOPED WITH Dy AND Hf

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Key Words: reactive elements, coating, oxidation, segregation, interface.

Dy/Hf co-doped two-phase (γ’+β) Ni-Al coatings were prepared by electron beam physical vapour deposition (EB-PVD). Cyclic oxidation behaviour of the coatings were investigated at 1100°C. The addition of 0.1at% Dy or 0.05at% Dy +0.3at% Hf to two-phase (γ’+β) Ni-Al coating significantly improved cyclic oxidation resistance, while addition of 0.5at% Hf to (γ’+β) Ni-Al coating no obvious effect on scale adhesion. The 0.1at% Dy doped and 0.05at% Dy +0.3at% Hf co-doped two-phase (γ’+β) Ni-Al coatings yielded mass gain of 1.24 mg/cm² and 1.04 mg/cm² after 100h cyclic oxidation. The Dy/Hf co-doped coating showed even further lower oxidation rate as compared to the corresponding Dy doped. In order to sufficiently exert reactive element effect (REE), extremely low solubility of the reactive element in each phase of the coatings should be guaranteed.