

Aluminum-silicon coatings on austenitic stainless steel (AISI 304 and 317) deposited by chemical vapor deposition in a fluidized bed [

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text (article)

Analítica

Aluminum-silicon coatings were deposited onto stainless steels AISI 304 and AISI 317. The deposition was performed at 540C with a ratio of active gases HCl/H2 of 1/15.3; argon was used as a carrier gas. The bed of the FBR-CVD process consisted of 2.5 g aluminum powder, 7.5 g silicon powder and 90 g alumina. After the coatings were deposited, each sample was given a heat treatment to improve its mechanical properties and oxidation behavior by diffusing the alloying elements. Thermodynamic simulation was performed with Thermo-Calc software to investigate the composition of the deposited material. The coated and uncoated specimens were exposed to temperatures of 750°C in an atmosphere where the vapor was transported to the samples using a flow of N2 of 40 ml/min and 100% water vapor (H2O). The coated specimens gained little weight during the thousand hours of exposure and will thus guard against a corrosive attack compared to the uncoated substrates. In addition, the coated stainless steels show an oxidation rate with a logarithmic trend while the uncoated steel oxidation rate showed a linear trend

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