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The Effect of Temperature on the Chromizing Process for Ferritic-Martensitic Steel (Conference Paper)

Alla, F.F.[a], Kurniawan, T.[a], Ani, M.H.B.[b], Nandiyanto, A.B.D.[c]

[a]Structural and Material Degradation Group, Faculty of Mechanical Engineering, Pekan, Pahang, Malaysia
[b]Faculty of Engineering, International Islamic University Malaysia, PO Box 10, Kuala Lumpur, Malaysia
[c]Department of Chemical, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudhi No. 229, Bandung, Indonesia

Abstract

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The formation of protective Cr_2O_3 layer was usually retarded in the high temperature steam oxidation of boiler tube materials. This condition makes the oxidation rate higher than that in dry condition. Therefore in this work, chromizing process is introduced to diffuse chromium on the surface of boiler steel so that it can act as a reservoir for the formation of Cr_2O_3 layer. The chromizing process was conducted on T91 steel by exposing it into alumina crucible. The crucible was exposed at different temperature (600°C-1050°C) under argon environment in the crucible that contains the chromizing mixture powder of masteralloy Cr, activator NH_4Cl and filler Al_2O_3. It was found that Cr diffusion was happened at higher temperature and it formed Cr carbide on the surface. It also clarified that this chromizing process can prevent the retardation of Cr_2O_3 layer.

Indexed keywords

Engineering controlled terms: Alumina, Aluminum compounds, Boilers, Carbides, Chlorine compounds, Crucibles, Ferritic steel

Compendex keywords: Alumina crucible, Argon environment, Chromizing process, Effect of temperature, Ferritic-martensitic steels, High temperature, Oxidation rates, Steam oxidation

Engineering main heading: Martensitic steel

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