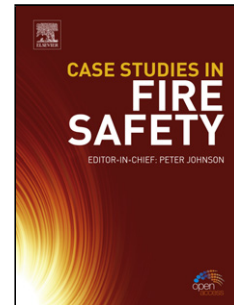


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Neural Network Modelling Studies of Steam Oxidised Kinetic Behaviour of Advanced Steels and Ni-based alloys at 800 °C for 3000 hours

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Highlights

- Steam oxidation test at 800 °C for 3000 hours was performed
- Higher mass gain of gamma prime (γ') than solid solution strengthened materials
- Protective scales developed under steam oxidation in Fe and Ni based materials
- Phase analyses showed development of Cr₂O₃ compound mainly
- Neural network was used to predict kinetic behaviour at high temperatures

Abstract

Two solid-solution strengthened alloys, (HAYNES[®] 230[®], 617 alloy), two gamma - prime (γ') strengthened alloys, (263 and HAYNES[®] 282[®]) and Cr rich steels (309S, 310S and HR3C) were tested under 1 bar pressure in 100% steam at 800 °C for 3000 hours. The steels showed better resistance in terms of corrosion behaviour, where no internal corrosion occurred. The exposed samples were characterised using SEM, EDS and XRD. Artificial neural networking (ANN) was used to predict

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