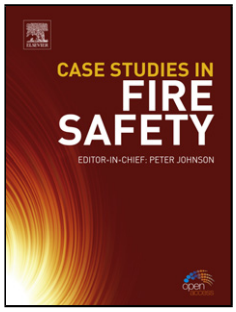

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High Temperature Oxidation Behavior of Ferritic Stainless Steel Containing W and Ce

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Highlights

- Ce and W are added in Fe-Cr alloy to improve its high temperature performance.
- Higher oxidation resistance is obtained with adding ~0.05 wt% Ce.
- Various content of W has apparently different effect on oxidation resistance.
- Adding Ce and W can reduce the amount of dissolved Laves phase at 1000–1050 ºC.
- Laves phase precipitated near oxide film has an important effect on oxidation process.

Abstract

The oxidation behavior of a ferritic stainless steel alloyed with elements, W and Ce, was studied at 950–1100 °C for up to 100 h. The oxide film was compact and uniform on the addition of Ce, and the number of defects at the oxide/metal interface was significantly decreased such that it exhibited good adhesion. The addition of Ce or combination of Ce and W reduced the number of dissolved Laves phase $(Fe,Cr,Si)_2(Nb,Mo)$ at 1000–1050 °C, which precipitated within the grains or at the grain boundaries. The inward growth of oxide film was