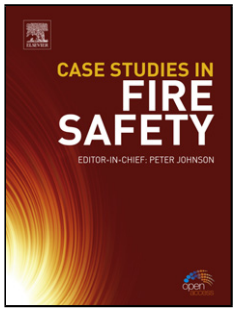

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Effect of Cr and Y_2O_3 on the oxidation behavior of Co-based oxide dispersion strengthened superalloys at 900 °C

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Highlights

- Oxidation of Co-based oxide dispersion strengthened alloys were characterized at 900 °C in air.
- Influences of Cr and Y_2O_3 addition on the oxidation behavior were investigated.
- Alumina-forming Co-based ODS superalloys were developed to be used at elevated temperature.

Abstract

In order to study the effect of Cr and Y_2O_3 addition on the oxidation behavior of novel Co-20Cr-10Al (wt.%) oxide dispersion strengthened (ODS) superalloys, an isothermal oxidation test was carried out at 900 °C in air. The addition of Cr altered the oxide scale from the multilayered scale with an external Co oxide / $CoAl_2O_4$ and an inner Al_2O_3 to a single Al_2O_3 scale. Y_2O_3 addition increased oxidation mass gain slightly but improved spallation resistance of the external Al_2O_3 scale.

Keywords

A. Cobalt; A. Alumina; B. EPMA; C. Oxidation