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The comparison of oxidation behavior of synthesized Fe_2Al_5 and FeAl

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Abstract: Recently, Iron aluminide compounds have attracted considerable interest due to their attractive physical and mechanical properties such as high-temperature applications, good oxidation and sulfidation resistance, low density and low production cost. In the present research, the following methodology was undertaken: first, FeAl and Fe_2Al_5 were synthesized. Then the Fe_2Al_5 and FeAl oxidation behavior was investigated in the air for 2-60 h at 850ºC. It was found that FeAl is more resistant to the oxidation compared to Fe_2Al_5. The FeAl oxidation rate reaches a plateau in higher temperatures while Fe_2Al_5 oxidation curve has an upward trend with the fluctuation. The reason for such a behavior is the difference in alumina growth mechanism

Keywords: Iron aluminide; Mechanism; Fe/Al ratio; Oxidation.