

2016

CHARACTERISATION MICROSTRUCTURAL AND MECHANICAL OF Ni/NiAl₂O₃, DEVELOPED BY MECHANICAL ALLOYING AND REACTIVE SINTERING.

Ali Mameri, Said Azem, Fares Djematene

Abstract : This study concerns the development of Nickel matrix composite; this composite was obtained after high-energy ball milling for long time of milling. The initial powders mixed are the Nickel oxide and Aluminum, the reduction of Nickel oxide by Aluminum called Aluminothermic reaction. The high energy milling active the aluminothermic reaction and occurred the Nickel-based composite, after milling we obtained powder composite with low density, which it necessary to following this process by reactive sintering. The milling and the sintering was performed under argon atmosphere. The reactive sintering at high temperature allows composite with high density. After sintering at 800 °C we obtained Ni/NiAl₂O₄. The powders milled and the samples sintering were characterized by X-ray diffraction, scanning electron microscopy, and the grain size of powders milled measured by laser analyzer granulometry. The Nickel aluminate (NiAl₂O₄) obtained has been applied in numerous fields to its high thermal stability and specific catalytic properties.

Keywords : Ni/NiAl₂O₄, reactive sintering, reactive milling, powder metallurgy, Aluminothermic reaction.