

**Combustion Synthesis and Processing of Fe-40at% Al Modified with  
Alumina**

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Combustion synthesis and hot forming were employed to manufacture dense materials based on an iron aluminide (Fe-40 at% Al) matrix, modified with alumina in the amount of 0.2 and 10 vol%. Porous products were hot forged and heat treated. Selected physical, chemical, and mechanical properties were examined, e.g., density, hardness HV, bending strength, resistance to high temperature oxidation. Forging and final heat treatment were found to have a beneficial effect on useful properties of the investigated materials. Nearly theoretical densities were attained (up to 98%) mainly due to the elimination of porosity. Bending strength increased approaching 2000 MPa for the Fe40Al matrix alone and 1050 MPa for the Fe40Al–Al<sub>2</sub>O<sub>3</sub> composites. Alumina dispersions unfavorably affected the mechanical properties of the Fe40Al intermetallic phase at room temperature.