



The experimental investigations of sintering kinetics of NiAl powder

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Abstract: The sintering is thermally-activated process depending on many technological factors e.g. temperature, time, external pressure, atmosphere, etc [1]. The progress in sintering measured by an increase in the cross-section of an inter-grain neck and a decrease in the distance between the centers of two neighboring grains results in an increase in the material's density. The results of preliminary studies dedicated to visualization of sintering kinetics of nickel aluminide spherical particles are presented. The NiAl powders were sintered using Spark Plasma Sintering method. The sintering process was conducted in variable technological conditions, what allowed to obtain a materials with different densification degree. Scanning electron microscopy and computed tomography were applied to describe the effects of sintering process. The microstructural evolution from the loosely packed particles system to almost fully dense materials was analyzed. Additionally, the materials properties (mechanical, thermal, electrical) were investigated as the function of the densification rate of the sintered materials.

Keywords: spark plasma sintering, nickel aluminides, computed tomography, microstructure, materials properties.

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