

Using of Microscopy in Optimization of the Ti-Al-Si Alloys Preparation by Powder Metallurgy

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Automotive and aerospace industries are searching for new high-temperature structural materials with improved properties (especially resistance to oxidation, thermal stability and mechanical properties) in combination with low density. Ti-Al-Si alloys fulfill these requirements, but they are very difficult to prepare. In this work, we propose technology including Self-propagating High-temperature Synthesis (SHS), milling and following consolidation by Spark Plasma Sintering. The technology has been tested on the TiAl₂₀Si₂₀ alloy. Special attention was paid to microstructure and phase composition, and their changes depending on the processing stage.

Keywords: Intermetallics, Powder Metallurgy, Self-propagating High-temperature Synthesis, Spark Plasma Sintering

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