

Sintering Properties of Mechanically Alloyed Ti-5Al-2.5Fe

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Abstract : In this study, Ti-5Al-2.5Fe alloy was prepared by powder metallurgy. The elemental titanium, aluminum, and iron powders were mechanically alloyed for 10 h in a vacuum atmosphere. A stainless steel jar and stainless steel balls were used for mechanical alloying. The alloyed powders were then sintered by vacuum hot pressing at 950 °C for a soaking time of 30 minutes. Pure titanium was also sintered at the same conditions for comparison of mechanical properties and microstructural behavior. The samples were investigated by scanning electron microscopy, XRD analysis, and optical microscopy. Results showed that, after mechanical alloying, a homogeneous distribution of the elements was obtained, and desired a-b structure was determined. Ti-5Al-2.5Fe alloy was successfully produced, and the alloy showed enhanced mechanical properties compared to the commercial pure titanium.

Keywords : Ti5Al-2.5Fe, mechanical alloying, hot pressing, sintering

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