

عنوان مقاله:

Manufacturing High-Strength HA-Ti Surface Composites by Friction Stir Processing with Different Filler Mixtures

محل انتشار:

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نویسندگان:

A Shahbaz - Department of Materials Engineering, Karaj Branch, Islamic Azad University, Karaj, Iran

Mehrdad Abbasi - Department of Materials Engineering, Karaj Branch, Islamic Azad University, Karaj, Iran

Hamed Sabet - Department of Materials Engineering, Karaj Branch, Islamic Azad University, Karaj, Iran

خلاصه مقاله:

In recent years, a wide range of studies have focused on the surface modification of titanium, especially in terms of its biomedical applications. However, comparatively less researches have been conducted on the fabrication of titanium surface composites in bulk form. The primary objective of this investigation is to successfully produce hydroxyapatite (HA)-Ti surface composites with a homogenous dispersion of nano hydroxyapatite particles through friction stir processing (FSP). The secondary aim is to investigate the effect of FSP parameters, specifically filler mixture, on the microstructure and mechanical properties of the composites. Two different mixtures of HA and FSP parameters, traverse speeds of 30 and 45 mm min⁻¹, rotational speed of 1200 rpm, and a conical tool shape, were used. It was found that the samples obtained by a filler mixture of HA-polyvinyl alcohol (PVA) showed better dispersion of HA in the Ti base, as well as higher tensile strength. Also, a 30 mm min⁻¹ traverse speed led to higher strength in both filler mixtures. Therefore, the sample produced by a traverse speed of 30 mm min⁻¹ and HA/PVA filler mixture was selected as the optimum sample.

کلمات کلیدی:

Friction Stir Processing, Titanium, Filler Mixture, Hydroxyapatite, Mechanical Properties

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