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عنوان مقاله:

Friction Stir welding of AA7075 by Adding SiC nano particles at the Interface

محل انتشار:

دومین کنفرانس بین المللی آلومینیوم (سال: 1391)

تعداد صفحات اصل مقاله: 5

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خلاصه مقاله:

In this study, Friction stir welding (FSW) process employed to fabricate aluminium matrix composite (AMC) along the joint line. For this purpose, Sic particles ranging from 45-65nm inserted tightly in a symmetrical pre-formed groove between the abutting plates. The material under study was AA7075-O.Microstructural and mechanical properties of weldments were investigated as a function of travelling and rotational speeds. Decreasing travelling speed and Increasing rotational speed resulted in higher tensile strength and ductility of the weldments. Optical microscopy (OM) examination revealed that stirred zone (SZ) grains were finer than those of thermomechanically affected zone (TMAZ), heat affected zone (HAZ), and base metal (BM) due to dynamic recrystallization induced by plastic deformation and frictional heat during FSW. SiC particles acted as heterogeneous nucleation site during dynamic recrystallization of Al grains and prevented the recrystallized grain from further growth. The latter effect is known as pinning effect. Furthermore, banding structure consisting partilcefree and particle-rich was observed in the NZ. It's found that 1250 rpm and 50 mm/min are the optimum welding speeds. Scanning electron microscopy (SEM) depicted agglomeration of SiC particles clearly.

کلمات کلیدی:

Friction stir welding, Sic nano-powder, AA7075, Composite

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