

عنوان مقاله:

Effects of reinforcement distribution on the mechanical properties of Al-Fe₃O₄ nanocomposites fabricated via accumulative roll bonding

محل انتشار:

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خلاصه مقاله:

This research developed new nanostructured Al-Fe₃O₄ composites via accumulative roll bonding (ARB). X-ray diffraction (XRD) analysis and field emission scanning electron microscopy were conducted to examine microstructural characteristics and particle distribution in the nanocomposites. Hardness and tensile strength tests were employed to examine their mechanical properties. After eight cycles of XRD analysis, the size of the Al crystals in the nanocomposites reached 198 nm. After eight cycles of tests on mechanical properties, the Al crystals exhibited a tensile strength and a hardness of 204 MPa and 63 HV, respectively. These values are higher than those achieved by pure Al. The depth of nanocomposite rupture observed in fractographic analysis revealed that a ductile fracture occurred in the materials because of the formation and growth of cavities.

کلمات کلیدی:

Metal matrix composite, Fe₃O₄, Accumulative roll bonding, Microstructure, Mechanical properties, Fractography

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