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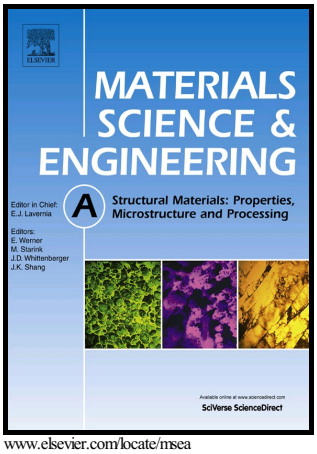

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A comprehensive analysis of extrusion behavior, microstructural evolution, and mechanical properties of 6063 Al–B_4C composites produced by semisolid stir casting

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Abstract

In this study, composites of aluminum alloy 6063 reinforced with 10 wt.% boron carbide microparticles were successfully fabricated by a combination of spark plasma sintering and stir casting methods, followed by hot extrusion. A systematic study on the relationship between extrusion process variables (i.e. extrusion ratio, temperature, and punch speed) and porosity, particle refinement, particle distribution and consequently tensile properties and fracture behavior of the composites was performed. Extensive electron microscopy analysis and tensile testing of the