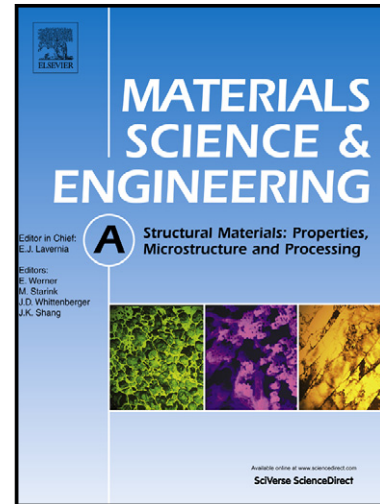


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On the age hardening behavior of thixoformed A356-5TiB₂ *in-situ* composite

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Abstract

The present article investigates the age hardening behavior of thixoformed A356-5TiB₂ *in-situ* composite prepared by a salt-metal reaction. The non-dendritic feedstock for thixoforming was prepared by a cooling slope casting technique. The results show that the thixoformed A356-5TiB₂ composite attains the peak hardness in only four hours. The detailed microstructural analysis of thixoformed composite show that enhanced ageing can be attributed to high dislocation density generated in α -Al matrix due to thermal mismatch and the thixoforming process itself. Furthermore, it was found that thixoforming not only increases the tensile strength of thixoformed composite in peak-aged condition but also increases the ductility by ~ 7.4%.

Keywords: Age hardening; Thixoforming; A356 alloy; TiB₂; *in-situ* composites; precipitates; dislocations;

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