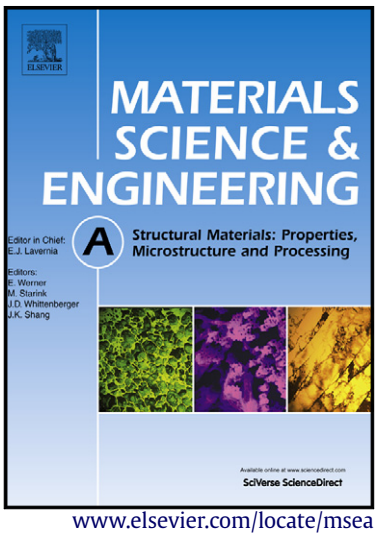

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Microstructure and mechanical properties of Fe-Al-Ti-B alloys with additions of Mo and W

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Abstract

Four quinary Fe-Al-Mo-Ti-B and Fe-Al-W-Ti-B alloys based on Fe_3Al produced by vacuum induction melting were investigated regarding their microstructure and mechanical properties. The microstructures consist of a Fe_3Al matrix with complex borides along grain boundaries. Compared to other Fe_3Al-based alloys the present alloys show favourably low ductile-to-brittle transition temperatures (BDTT) and a markedly high creep strength at 650 °C. The latter is most pronounced for an alloy whose strength, besides strengthening by solid solution hardening through Mo and by the boride precipitates, is further enhanced by stabilising the $D0_3$-ordered structure up to higher temperatures.

Keywords: A. light and electron microscopy, mechanical characterization B. Fe_3Al based alloys C. casting D. precipitation, ordering