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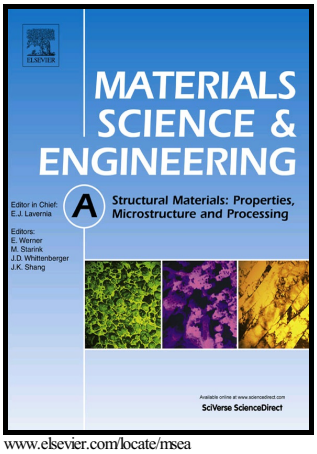

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Abstract

Vacuum rapid solidification technique was utilized to prepare TiB+TiN/Ti inoculants ribbons, which were added to TC4 alloy melt to get refined titanium matrix composites (TMCs). For comparing and analyzing the influence of inoculants, authors mainly studied microstructure and mechanical properties of TC4 alloy modified and reinforced by TiB+TiN/Ti inoculants ribbons prepared by *in situ* reaction. The *in situ* reaction are: (1) $3Ti + 2BN \rightarrow TiB_2 + 2TiN$, (2) $Ti + TiB_2 \rightarrow 2TiB$. Microstructure and morphology observation showed that the grain size of TMCs was refined as the volume fraction of reinforcements increased. It is worth noticing that the reinforcements in the TMCs prepared by inoculating method tend to distributed in matrix homogeneously. The tensile test results showed that the tensile strength of TMCs increased significantly by inoculating. Inoculating method showed advantages to preparing by *in situ* reaction directly. The hardness and wear-resisting property of TMCs were also investigated and found to be promoted as reinforcements content increased.