

## Interactions in Titanium Matrix Composites Reinforced by Titanium Compounds by Conventional PM Route

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### Abstract

Titanium metal matrix composites were produced. The powder metallurgy route applied was a conventional route consisting of blending titanium matrix powder with different percentages of various titanium compounds, as reinforcement particles, followed by cold compaction in a uniaxial press with a floating matrix and a sintering process in a vacuum furnace. This work studied the different interactions between the titanium matrix and the various titanium compounds added. To evaluate these interactions microscopic techniques are used principally, optical and electronic microscopy, with EDX techniques. By microstructural analysis the reactivity between reinforcement and matrix particles was investigated, and any new phases that formed during the sintering process were evaluated. In addition, microhardness test were conducted to study the mechanical properties associated with the new phases, and to evaluate the relative strength or weakness of the interfacial zones.

**Keywords :** titanium matrix composites, powder metallurgy, TiC reinforcement, TiN reinforcement, TiSi<sub>2</sub> reinforcement, interparticle interactions.