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**Syntheses of Ti-Al-Si-B-C nanocomposites by mechanical alloying and explosive compaction**

ABSTRACT. Nanocomposites of Ti-Al-Si-B-C systems are characterized by unique physical and mechanical properties. They are attractive and can be used in a wide range of areas including aerospace, power engineering, machines and chemistry. Coarse crystalline Ti, Al, Si and C powders and amorphous B were used as initial materials. Different compositions of Ti, Al and C were prepared for mechanical alloying. Selection of blend compositions was made on the base of phase diagrams. Powders were mixed accordingly to produce blends, which were processed in high energy “Fritsch” planetary premium line ball mills for mechanical alloying, synthesis of new phases and ultrafine particle formation. Processing time varied between 1 and 10 hours. Optimal regimens of blend preparation were determined experimentally. Ball-milled blends were investigated to determine mechanical alloying. Ultrafine blends were consolidated using explosive compaction technology for bulk ultrafine-grained composite formation and investigated structurally.

**Keywords:** composite materials, nanostructure, nanotechnologies

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