

Vol. 13, No. 4, 2004

**Effect of B on the Self-propagating High-temperature Synthesis
of Ti -Al Intermetallic Compounds**

Baichun Mu¹, Qiang Li¹, Jingyuan Yu¹, Xudong Sun¹, and Xiaozhi Hu²

¹*School of Materials and Metallurgy, Northeastern University, Shenyang 110004, China*

²*Department of Mechanical Engineering, The University of Western Australia)*

ABSTRACT

Self-propagating high-temperature synthesis (SHS) method was used to prepare Ti-Al intermetallic compounds from Ti, Al and B powders. The effect of SHS parameters and the amount of Al and B on the explosion mechanism were investigated. The results show that the ignition time of the thermal explosion decreases and the exothermic peak rises by decreasing the Al amount or by increasing the heating rate. It was found that the introduction of B powder into the Ti-Al blends has the effect of slowing down the thermal explosion, leading to a preferred control of the explosion process. The addition of B also led to the formation of TiB₂ particles which can restrain the growth of Ti₃Al grains, resulting in a refined microstructure. Ti-Al intermetallic compounds with a microstructure of acicular Ti₃Al (α_2) phase and TiAl(γ) phase were produced.