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SHS Metallurgy of Titanium Aluminides

D.E. Andreev, V.N. Sanin and V.I. Yuxhvid

Institute of Structural Macrokinetics and Materials Science,

Russian Academy of Sciences, Chernogolovka, Moscow Region, 142 432 Russia

The first experimental data on the production of cast titanium aluminides by the method of SHS metallurgy are reported. Combustion of weakly exothermic systems has been studied when added to a "chemically inert" highly exothermic agent. Introduction of an energy-generating additive gives the possibility of setting the required combustion temperature (above the melting point of the final products). At the optimum ratios of the "energetic additive" to the desired mixture, one can synthesize cast titanium aluminides (TiAl_3 , TiAl , Ti_3Al) as well as solid solutions with various Al contents. High-quality superdense aluminide ingots have been formed at application of centrifugal forces. Investigation of the phase composition and microstructure of the as-obtained ingots has revealed their high uniformity.

Keywords: *combustion synthesis, titanium aluminides, gravity, chemical conversion, phase formation.*