

## Ignition and Burning Analysis of the Ti-B and Ti-B-C SHS Systems

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Using the Merzhanov adiabatic wave velocity and the values of the Zhang-Stangle ignition model, a new nondimensional equation has been derived which can help in the simultaneous prediction of the ignition characteristics and expectable changes in the burning velocity. Therefore, the parameters affecting the ignition temperature and the burning velocity of gasless mixtures were investigated to show that the ratio of the product's heat capacity to that of the reactants is an important parameter for determining the burning velocity, in addition to the Zhang-Stangle ignition variables. It was also shown that at the constant combustion temperature, the change in the thermal conductivity of the Ti-B diluted system with less than 20% TiB<sub>2</sub>, is the main cause of the decrease in the burning velocity. The changes in the burning velocity of the Ti-B-C mixtures were also studied. We found that when Ti and C were added as diluents they affected the Ti+2B reaction and participated in the secondary reaction.