

The investigation of reaction parameters on the reactivity in the preparation of TiB_2 by SHS

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SHS(Self-propagating High-temperature Synthesis) is a recently developed method which was high temperature reaction to synthesize various materials that are capable of self-propagating reaction. In order to initiate the reaction, heat sources such as filament or arc used on one side of compact powder. Impurities in the powder were burn-out during the high temperature reaction and the remaining oxides were cleaned by acid(H_2SO_4) leaching. The preparation of TiB_2 by SHS in B_2O_3 -Mg- TiO_2 system was investigated in this study. In the preparation of TiB_2 , the effect on reactivity and reaction products of the initial pressure of inert gas in reactor, the content of Mg and TiO_2 in mixture was investigated. The minimum initial pressure of inert gas in reactor for SHS reaction in this system was 25atm, and as the pressure increased, the concentration of unreacted Mg decreased and combustion temperature increased. At the initial inert gas pressure in reactor of 25atm, the optimum composition for the preparation of pure TiB_2 was $B_2O_3 + 5Mg + TiO_2$. The TiB_2 synthesized in this condition had an irregular shape and the particle size of 1~5 μm .