The effect of reductant on product in the preparation of BaTiO3 powder from BaO2 by SHS

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Abstract

We have investigated on the preparation of $BaTiO_3$ powder from BaO_2 and TiO_2 by SHS. C and NaCl were used as reduction agent, PSCA(Particle Size Control Agent) respectively. The effects of the various concentration of reduction agent and PSCA, reaction mixture mass, post treatment on the product were investigated in the preparation of $BaTiO_3$ by SHS.. The optimum reaction system and composition in this reaction system were $BaO_2 + TiO_2 + 0.11Mg + 0.2C + 0.75NaCl$ in the Ar atmosphere. As the mixture mass for the reaction was increased, the more stable combustion wave appeared and the reaction product showed more uniform particle size distribution by ultrasonic treatment. We have conducted the sintering experiment at the temperature of 1300℃, the time of 2 hours and the atmosphere of air to measure the dielectric properties of $BaTiO_3$ synthesised in this work, and the sample sintered in this condition showed 2,290 of dielectric constant at 100℃ and 13,890 at curie point(129℃).