



Microwave Synthesis of carbon alumina

Abstract: respectively oxide, carbon and metal oxides, carbon materials, to study the feasibility of carbon oxides Al_2O_3 microwave heating as a means of synthesis, the effect is composed of two different materials, optimizing the synthesis conditions. Sintered product was analyzed by XRD phase, morphology was observed by SEM and EDX analysis for determining elemental composition point. The results show that: when the oxide, carbon materials under $1700\text{ }^\circ\text{C}$ can generate carbon oxides Al_4C_3 but not observed; when metal oxides, carbon materials can be observed under $1500\text{ }^\circ\text{C}$ and carbon oxides Al_4C_3 Al_2O_3 .

1 Introduction

There are two HCs Al_4O_4C and Al_2O_3 in Al-OC system, which not only has a high melting point oxides, good temperature stability, corrosion resistance, etc., but also has high thermal conductivity carbide, thermal expansion coefficient, resistance and good thermal shock resistance, is expected to become an excellent structural ceramic materials and refractory non-oxide materials or as an antioxidant additives containing carbon refractories.

Currently, the preparation process for such few studies of carbon oxides, the main way to adopt a synthetic oxides, carbon and metals, oxides, carbon or carbide as the raw material, synthesized by conventional electric heating at a high temperature, cost high technical difficulty, it is not suitable for large-scale production and other shortcomings. Microwave heating is completely different from a conventional heating, it does not require an external heat source, the heating process does not rely on heat conduction and heat radiation, but on the object to absorb microwave energy into thermal energy itself overall improvement to a certain temperature.

Microwave heating has uniform heating, heating speed, high efficiency heat, and can reduce the reaction temperature, sintering time savings, shorten the production cycle, while less pollution to the environment, has been more widely used in the synthesis and preparation of materials. There is no report of such carbon oxides using microwave synthesis. In this study, the synthesis of microwave heating as carbon oxides Al_2O_3 , design oxides, carbon and metals, oxides, carbon combination of two materials, the composition performed by phase analysis and morphology, consisting of comparing two different materials synthesis results, to determine the feasibility of using microwave heating oxide synthesis, investigation and optimization of process conditions affect the synthesis, for industrial production to provide the basics.