Microwave Synthesis of carbon alumina Experimental

Experimental

1.1 materials and equipment

Al2O3: 99% or more, and 325 mesh; Acetylene black: purity of 99% or more, an average particle size 30nm; Graphite: size 45-500um (325 mesh -35 mesh), the carbon content of 8-99.9%; nano-Al powder: more than 99%, with an average particle size of 50nm. SL1001 electronic balance, Max = 1000.0g, d = 0.1g; 769YP-40C powder tablet press; X-ray diffraction; High-temperature sintering microwave: Microwave output power 4kW, rated output frequency 2.45GHz. High-temperature microwave sintering Lang peak metal production.

1.2 experimental procedure

Composed of two different materials were used in the ratio of the molar ratio of Al2O3: C = 1: 1.5 and Al2O3: Al: C = 4: 4: 3. Converted into quality electronic weighing scales than the latter, in corundum grinding mortar mix, the addition of PVA glue or as a binder and mixed thoroughly grind after drying at room temperature. Each weighing about 2g raw material after mixing well, the diameter of 10mm were filled tablet press mold under a pressure of about 5 MPa pressing. Microwave heating, dried tangerine alumina mullite brick placed in the borehole, surrounded by high alumina fibers and mullite brick surround, etc., in order to reduce heat losses due to heat conduction and radiation caused by the way.

Pressed specimens buried corundum clamp installed in the vortex of graphite, release the microwave heating, the heating process Walter hydrogen, thermal insulation value when the temperature is raised to the temperature needs to be set by the power to adjust the temperature, the temperature fluctuations in the within ± 10 ℃, after the end of the insulation, and other dried by natural cooling to room temperature after removal. By XRD analysis of the phase composition of the sintered product, SEM observation of the microstructure of the sintered product morphology characteristic points spectroscopy.