



Microwave Inorganic Synthesis

In the square and inorganic synthesis, mainly for microwave sintering, combustion synthesis and hydrothermal synthesis. The so-called microwave sintering or microwave combustion synthesis refers to microwave irradiation of solid materials, materials absorb microwave energy and rapid warming, after reaching a certain temperature, causing complete combustion synthesis reaction or sintering process.

Microwave sintering uniform heating, heating rate, and the advantages of combustion wave propagation can control, this method is mainly used for the synthesis of ceramics, including ceramic oxides, metal borides, Si_3N_4 , metal carbides, piezoelectric ceramics. Also enables the use of microwave sintering of ceramic welding, the joint is more uniform, avoiding the cracks, and a higher strength.

Microwave hydrothermal synthesis can be used to prepare oxide powder, nitride powder, zeolite, etc. When using microwave irradiation forced hydrolysis FeCl_3 , due to allow the salt solution is heated uniformly in a short period of time, to eliminate the influence of moisture gradient, while allowing germination precipitate nucleation phase in an instant, the powder particle size is more prepared smaller, more uniform, and can realize quantitative precipitation, increasing the yield. Similarly, microwave radiation can also be used metal nitrate, sulfate or chloride solution prepared by direct decomposition of various oxide ultrafine powder, but also with an organic solution of microwave irradiation to prepare metal oxide ultrafine powder.

Since molecular sieve can microwave reaction system is uniformly heated in a short time, and therefore can promote germination nuclei, accelerated crystallization rate, in order to achieve synthesis of the molecular sieve, now has a lot of reports about the synthesis of zeolite, synthetic Y-type zeolite comprising , ZSM-5 and the like.

Can also be applied to the microwave dilute zeolite ion exchange reaction, reducing the switching time and increase the degree of exchange. In addition to the solid phase, liquid phase reaction, microwave can be used for gas-solid reactions, such as the reduction catalyst without direct role in the microwave Carbon Reduction of SO_2 and NO to N_2 to S.