

Synthesis of Y_2O_3 ultrafine particles by emulsion flame spray pyrolysis

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Ultrafine particles (<200nm) are of interest, because the chemical and physical characteristics of the particles are remarkably different from those in bulk form. There is a variety of techniques available for producing ultrafine particles, including emulsion method, hydrothermal processing, sol-gel method, gas phase reaction, and flame spray pyrolysis. Although the sol-gel method is successful in the preparation of spherical ceramic nanoparticles, the raw materials of metal alkoxide of the process are too expensive to use in a large-scale production. FSP method is very economical process, but the control of particles size is very difficult.

At This study, Y_2O_3 nano particles were synthesized by emulsion flame spray pyrolysis. Emulsion flame spray pyrolysis method is very economical process and the control of particles size can be performed by the control of emulsion droplet size. The measurement of emulsion droplet size was investigated by DLS (Direct Light Scattering) method. The size and the morphology of Y_2O_3 nano particles synthesized by emulsion flame spray pyrolysis were was investigated by TEM, SEM.