

Synthesis of metal oxide nanoparticles using supercritical methanol

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Metal oxide nanoparticles - ceria (CeO_2), zinc oxide (ZnO) was prepared in the batch type reactor using supercritical methanol as the reaction medium. Since the critical point of methanol is lower than that of water, it is possible to synthesize metal oxide nanoparticles in milder condition; lower temperature and pressure condition than water is required. Several kinds of organic reagents such as oleic acid, oleylamine and dodecyl aldehyde were applied to prevent the aggregation of nanoparticles during synthesis. The synthesized nanoparticles were analyzed by high resolution transmission electron microscope (HR-TEM), X-ray diffraction (XRD), Fourier transform IR (FT-IR), Thermogravimetric analysis (TGA).