

Preparation of ceria nanoparticles through supercritical hydrothermal synthesis

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Ceria (CeO_2) has been used in many applications such as catalysis, optics, biosensing and electrochemistry. Especially in catalysis, it is important to prepare ceria with large surface area. Ceria nanocrystals with various shape has been made through several synthetic methods with organic-solution phase and liquid-solid-solution phase. In this work, ceria nanoparticles were prepared by supercritical hydrothermal synthesis with batch type reactor. Hexanoic and decanoic acid were used as modifier reagents to avoid aggregation of particles. The particles were prepared with the conditions of 400°C and 300bar and analyzed by high resolution transmission electron microscope (HR-TEM), X-ray diffraction (XRD) and Fourier transform IR (FT-IR).