Synthesis of barium titanate using supercritical water

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Barium titanate have been a significant material in the electronics industry, and the size of barium titanate particles is important since it affects the properties of barium titanate and miniaturization of electronics device. Many methods have been developed to synthesize barium titanate nanoparticles, one of the methods, hydrothermal method using supercritical water, is promising because it has a simple process, requires a short reaction time, and can be applied to a continuous system. In this study, barium titanate nanoparticles are size-controllably prepared from hydrothermal method using supercritical water using TiO2 having different size as Ti precursors. Reaction time, initial molar ratio, and strong base addition are changed to synthesize pure barium titanate nanoparticles. The synthesized barium titanate powders were characterized by HR-TEM and XRD. HR- TEM images of synthesized particles show that size of barium titanate similar to size of initial titanium dioxide. This result indicates that size of barium titanate can be controlled by the size of TiO2 as Ti precusors.