



Contribution ID: 31

Type: Oral

Micrometers to nanometers conversion process in perovskite BaTiO₃ particles

Monday 28 November 2016 16:15 (15 minutes)

A one-step “top-down” process was proposed in this work to obtain nanoparticle products of tetragonal barium titanate (BaTiO₃; BT) with highly accurate stoichiometry and morphological control. A micrometer-sized BT precursor significantly decreases to nanometer-sized product particles and its irregular shape changes to nearly spherical with narrow size distribution via surface active etching. Both XRD and Raman results of BaTiO₃ nanoparticles indicated a tetragonal crystal structure. The 77.5 ± 2.5 nm sized BaTiO₃ powder product still polarized spontaneously at room temperature and the ferroelectric phase transition was confirmed at around 127 °C. Dielectric permittivity was found to be ~ 166.42 by Landauer-Bruggeman effective medium approximation (LB-RMA). Experimental procedures revealed a possible process mechanism observed within the etched surface and Oriented-attachment growth models, and this demonstrated approach could be used as an excellent platform for preparing advanced ceramic nanoparticles.

Primary author: CHAROONSUK, Thitirat

Co-author: Prof. VITTAYAKORN, Wanwilai (Collage of Nanotechnology, King Mongkut's Institute of Technology Ladkrabang)

Presenter: CHAROONSUK, Thitirat

Session Classification: Falcon 1

Track Classification: Nanomaterials & nanostructures