

Effects of Acoustic Wave on Microwave - Hydrothermal Preparation of Lead Titanate Powders

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The effects of acoustic wave, microwave power and reaction time on phase purity and characteristics of composing particles of lead titanate (PbTiO₃) powders prepared under microwave – hydrothermal conditions from the reactions between Pb(NO₃)₂ and TiO₂ using KOH as a mineralizer were investigated. The prior application of ultrasonic wave commonly led to the oxide phases, rather than the desired PT. The reaction time and microwave power of at least 1.5 hours was necessary for the formation of PT when the microwave power was set at 720 W. The shorter effective reaction time of 1 hour was however achieved with higher power of 810 and 900 W. Size of the primary particles were nonetheless independent of the synthetic conditions, being distributed within a small range of 0.1-1.7 micron and mostly present as large aggregates.

[1] A. Rujiwatra, C . Wongtaewan, W. Pinyo, S . Ananta, Mater. Lett. **61** 4525 (2007).

[2] S. Tapala, N. Thammajak, P. Laorattanakul, A. Rujiwatra, Mater. Lett. **62** 3685 (2008).