



>>Entry Name: Barium titanium oxide (BaTiO₃)

Synonym(s): Barium titanate (BaTiO₃), 10Cl. Barium metatitanate

CAS Registry Number: 12047-27-7

Extra CAS Registry Numbers(s): 12642-89-6

BaTiO₃

Molecular Formula: BaO₃Ti

Molecular Weight: 233.205

Accurate Mass: 233.837924

Percentage Composition: Ba 58.89%; O 20.58%; Ti 20.53%

General Statement: Has the cubic perovskite structure above 120°; below 120° it transforms successively to 3 ferroelectric phases

Source/Synthesis: Prepd. by heating an intimate mixt. of TiO₂ and BaCO₃ at =1300°. Ultrafine (20 nm) particles prod. by heat treatment of polymeric precursors, e.g. BaCO₃/Ti(OCH(CH₃)₂)₄ in citric acid/ethylene glycol mixt. at 500-900°; cubic form obt. at lower temps.; tetragonal form at 900°; mixt. at intermediate temps.

Use/Importance: Used in electronic devices, e.g. dielectric amplifiers, in computer elements, in memory devices and in ferroelectric ceramics

Physical Description: Light grey-buff powder. Ferroelectric

Melting Point: Mp 1625°

Solubility: Insol. H₂O

Other Data: Tetragonal form has high dielectric const.

Aldrich: 46763-4

Fluka: 11848

References:

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Jona, F. *et al.*, *Int. Ser. Monogr. Solid State Phys., Vol. 1 Ferroelectric Cryst.*, Pergamon, Oxford, 1962, 108, (*ferroelectricity, rev*)

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Subbarao, E.C., *Solid State Chem.*, 1974, 635, (*rev*)

Kirk-Othmer Encycl. Chem. Technol., 3rd edn., Wiley, 1978, **3**, 479; **10**, 9

Cournil, M. *et al.*, *Oxid. Met.*, 1979, **13**, 77, (*synth*)

Kirby, K.W., *Mater. Res. Bull.*, 1988, **23**, 881, (*synth*)

Diaz-Guernes, M.J. *et al.*, *Spectrochim. Acta A*, 1989, **45**, 5, (*ir*)

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