Solid State Synthesis of $CaMnO_3$ from $CaCO_3$-$MnCO_3$ Mixtures by Mechanical Energy

Vittorio Berbenni, Chiara Milanese, Giovanna Bruni, Pacifico Cofrancesco, and Amedeo Marini

CSGI – Unità Operativa di Pavia – Dipartimento di Chimica Fisica dell'Università di Pavia, Via Taramelli 16 – 27100 Pavia, Italy

Reprint requests to Dr. Vittorio Berbenni. Fax: 0039-0382-987575.
E-mail: berbenni@matsci.unipv.it

Z. Naturforsch. **61b,** 281 – 286 (2006); received December 14, 2005

A solid state synthesis of calcium manganite ($CaMnO_3$) is described where equimolecular mixtures $CaCO_3$:$MnCO_3$ have been subjected to mechanical stress (high energy milling) so yielding $CaCO_3$-$MnCO_3$ solid solutions of nanometric particle size. TG measurements have shown that a link exists between milling time, the extent of non-stoichiometry and the milling-induced decomposition of $MnCO_3$ to Mn_3O_4. A short (2 h) annealing at 850 °C performed on a sample mixture milled for 25 h leads to non-stoichiometric $CaMnO_{3-x}$. No sure conclusion could be drawn for the stoichiometry of $CaMnO_3$ obtained, under the same annealing conditions, from a mixture milled for longer time (150 h). No synthesis of $CaMnO_3$ could be effected by long (48 h) annealing at 1200 °C of mixtures that had not been subjected to mechanical stress.

Key words: TG Analysis, $CaMnO_3$, Mechanical Activation, Solid State Synthesis