Kinetics Of Thermal Decomposition Of Strontium Carbonate

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Abstract

Strontium carbonate ($SrCO_3$) is used for manufacturing of hard magnets, X-Ray tubes, special glasses, ceramics and other strontium chemicals. $SrCO_3$ usually decomposes at early stages of these high temperature production processes. The kinetics of the calcination of $SrCO_3$ was investigated in a laboratory scale muffle furnace, open to the atmosphere. Calcination experiments were run at 1000, 1100 and 1200°C for different process times between 5 and 120 minutes. Calcination rates were calculated from the mass loss of the dry starting material. $SrCO_3$ was totally decomposed to strontium oxide (SrO) and carbon dioxide (CO_2) gas at 1200°C for 45min. Kinetics calculations, were made for up to 45min experiments at three different temperatures and suited to the first-degree reaction kinetics. The activation energy of the $SrCO_3$ was evaluated to be 195 kJ/mol.

Keywords: Strontium carbonate, thermal decomposition, calcination, reaction kinetics