

A Dissertation Report on

**Study on Sintering Characteristics and Dielectric Properties of**

**$\text{La}_2\text{Ti}_2\text{O}_7$**

Submitted in partial fulfillment of the requirements

of the degree of

Master of Technology

By

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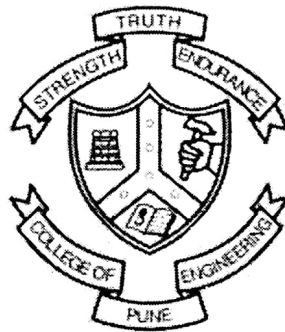
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## Abstract

Single phase  $\text{La}_2\text{Ti}_2\text{O}_7$  is synthesized by Solid State Reaction method confirmed by XRD. For deciding sintering temperature linear shrinkage behaviour of  $\text{La}_2\text{Ti}_2\text{O}_7$  ceramic sample were studied with the help of Dilatometer. Highly dense  $\text{La}_2\text{Ti}_2\text{O}_7$  ceramic sample synthesized by sintering at 1350, 1375, 1400 and 1425°C for 4 hr. The dielectric properties of  $\text{La}_2\text{Ti}_2\text{O}_7$  were investigated as function of frequency (1 Hz -1 MHz) at room temperature and dielectric properties of  $\text{La}_2\text{Ti}_2\text{O}_7$  ceramic sample sintered at 1375 °C for 4 hours were investigated as function of temperature (50-1000 °C) and frequency (1 Hz -1 MHz). At 1 KHz, the dielectric permittivity varies from 93.61 at 50°C to 8413 at 1000°C. In order to study grain growth kinetics of  $\text{La}_2\text{Ti}_2\text{O}_7$ , isothermal sintering was carried out at 1325, 1350 and 1375 °C for the time durations of 2, 4, 6 h at each of these temperatures. Average grain size increased from 2.07  $\mu\text{m}$  to 8.40  $\mu\text{m}$  on increasing time and temperature of sintering.