

DSC AND DIELECTRIC INVESTIGATIONS IN NEW OXIFLUORIDE CERAMICS $\text{Ca}(\text{Ti}_{1-x}\text{Li}_x)\text{O}_{3-3x}\text{F}_{3x}$

H. CHERFOUH¹, A. MEZROUA², B. MELOUANI² and L. BENZIADA-TAÏBI¹

¹ *Institut de Chimie, USTHB, ALGERIA*

² *UER de Chimie, EMP, ALGERIA*

Barium titanate (BaTiO_3), strontium titanate (SrTiO_3) and their solid solutions are of great interest and have been intensively studied worldwide because of their applications as ferroelectric non-volatile memories (FRAMS) and in integrated technologies. In comparison with these two perovskites, there are only limited studies on CaTiO_3 and related compounds around the temperature range of practical application as electronic ceramics. The aim of this work is to investigate the system $\text{CaTiO}_3 - \text{CaLiF}_3$.

Calcium titanate is previously synthesized by solid state reaction at 850 °C. Various compositions are then prepared from CaTiO_3 and CaLiF_3 . The powder mixtures are pressed in pellets and sintered at 950 °C. The ceramics obtained are examined by Scanning Electron Microscopy (SEM) and X-ray diffraction. A solid solution $\text{Ca}(\text{Ti}_{1-x}\text{Li}_x)\text{O}_{3-3x}\text{F}_{3x}$ occurs in the composition range $0 \leq x < 0.4$. The phase transitions in these new perovskite-type ceramics are investigated by Differential Scanning Calorimetry (DSC) and dielectric analysis in the temperature range 300 – 873 K. In any case, three phenomena are observed at T_1 , T_2 and T_3 which values are dependent of composition. The temperatures corresponding to $\text{Ca}(\text{Ti}_{0.95}\text{Li}_{0.05})\text{O}_{2.85}\text{F}_{0.15}$ ceramic are respectively $T_1 = 464$ K, $T_2 = 653$ K and $T_3 = 760$ K whereas pure CaTiO_3 undergoes only two phase transitions at much higher temperatures: $T_1 = 1398$ K and $T_2 = 1523$ K.