

SYNTHESIS AND PROPERTIES OF NEW PHASES IN THE SYSTEM



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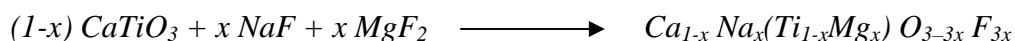
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The perovskite ceramic materials ABO_3 are in huge expansion in the world. They play a fundamental role in various industrial applications because of their piezoelectric, pyroelectric and ferroelectric properties. Moreover, the recent processing development of thin films and the rapid advances in the silicon technology and the integrated – circuits induced a more and more request of dielectric ceramics. The research in this field has seen an exceptional growth since a decade.

Among these materials, we have been interested by the calcium titanate. Recent studies on the system CaTiO_3 – lanthanum oxides and CaTiO_3 – actinium oxides show the important role that the calcium titanate plays in the treatment and the storage of nuclear waste. Further more, CaTiO_3 and its derivatives are used in hydrocarbon catalyse. Our objectives are to prepare new oxyfluoride materials belonging to the $\text{CaTiO}_3 - \text{NaF} - \text{MgF}_2$ system and to study their structural, dielectric and calorimetric properties.

Oxyfluoride phases have been synthesized in free atmosphere, using the CaTiO_3 perovskite and the fluorides NaF and MgF_2 , according to the solid state reaction :



The purity of CaTiO_3 and oxyfluorides has been checked by X-Ray diffraction (XRD). The crystalline parameters have been determined then refined by the least square method. The phase transitions in these new phases have been investigated by dielectric measurements and differential scanning calorimetry (DSC).