

THE SOLID SOLUTION $\text{Sr}_{1-x}\text{K}_x(\text{Ti}_{1-x}\text{Mg}_x)\text{O}_{3-3x}\text{F}_{3x}$: SYNTHESIS AND X-RAY CHARACTERIZATION

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Strontium titanate SrTiO_3 belongs to the ABO_3 perovskite family. It is a well known paraelectric perovskite structured material which is cubic above 105 K. Beyond this temperature the dielectric permittivity is nearly temperature independent with a high value of ϵ'_r and therefore can achieve a reasonable charge storage density for high density memory application. The objective of this work is the investigation of the chemical system $\text{SrTiO}_3\text{--KMgF}_3$.

The fluoride KMgF_3 and the titanate SrTiO_3 are firstly synthesized. KMgF_3 is heated at 700°C in a gold sealed tube whereas heating is performed in air at 1100 ° C for strontium titanate. Several mixtures $(1-x) \text{SrTiO}_3 - x \text{KMgF}_3$ are then prepared and shaped to discs by pressing. The pellets thus obtained are sintered at 930 ° C in air atmosphere. X-ray diffraction analysis were carried out to control the purity and to identify the different phases.

As a result, a new solid solution $\text{Sr}_{1-x}\text{K}_x(\text{Ti}_{1-x}\text{Mg}_x)\text{O}_{3-3x}\text{F}_{3x}$ has been obtained in the composition range $0 \leq x \leq 0.20$. Each phase is a complex perovskite isomorphous with NaNbO_3 .