

NOVEL ELECTROCERAMICS RELATED TO CaTiO_3 FOR CLASS I CAPACITORS

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The perovskite-type compounds ABO_3 arouse a great interest in the electronic industry thanks to their easy synthesis by solid state reaction, sol-gel or hydrothermal method and their properties. Calcium titanate CaTiO_3 belongs to this range of materials sharing a combination of electrical, mechanical, thermal and optical characteristics which are making news in several scientific journals worldwide. Like a lot of perovskites, CaTiO_3 has various applications such as the treatment and storage of nuclear wastes, catalysis, luminescence... The purpose of this work is the preparation and characterization of new ceramics deriving from CaTiO_3 .

CaTiO_3 is previously synthesized by solid state reaction between CaCO_3 and TiO_2 (rutile) at 850°C . Pellets are then prepared from mixtures of $(1-x) \text{CaTiO}_3 + x \text{MgF}_2 + x \text{LiF}$ and sintered at 950°C for 4h. Novel perovskite phases with general formula $\text{Ca}_{1-x}\text{Mg}_x(\text{Ti}_{1-x}\text{Li}_x)\text{O}_{3-3x}\text{F}_{3x}$ are obtained. XRD patterns and SEM observations are collected at room temperature. DSC analysis and dielectric measurements are carried out to investigate the phase transitions in these oxyfluorides. The $\epsilon'_r - T$ curves are compatible with the requirements of class I capacitors.