

# **DIELECTRIC MATERIALS WITH NON-LINEAR PROPERTIES: FROM DEFINITIONS TO APPLICATIONS**

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Nowadays, Chemistry is at the interface of a lot of disciplines: Chemistry and Physics, Chemistry and Electronics, Chemistry and Mathematics, Chemistry and Mechanics, Chemistry and Biology, Chemistry and Medicine...

In the field of new technologies, Materials play a major role in our life and became the key of success for electronic industry. During the last decade, solid dielectrics with non-linear properties are intensively studied worldwide thanks to their huge range of applications in computers, mobile telephones and digital radio as capacitors, sensors, actuators, resonators, memories...The investigations are focussed on the microwave region both from theoretical and experimental points of view.

In Materials Sciences a wider perspective with multidisciplinary groups of research takes place to establish areas of specialist excellence in the field. The research in our group is mainly devoted to the synthesis and characterizations of novel oxifluorides deriving from  $ABO_3$  perovskites. These materials could be elaborated in several structural features by various methods and are potential candidates for the manufacture of various microelectronic devices or as catalysts in the oxidation of light hydrocarbons.

The talk will be subdivided in a theoretical and an experimental part. In a first time, we shall introduce the five classes of non-linear dielectric materials and their applications: piezoelectrics, pyroelectrics, ferroelectrics, anti-ferroelectrics, ferroelastics. In a second step, a number of chemical and physical experiments on new fluorinated ceramics performed by our research group will be presented and discussed.

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