DIELECTRIC PROPERTIES IN $BaTiO_3$ DERIVED CERAMICS

L. BENZIADA[1] and **R. VON DER MÜHLL**[2]

[1] *Laboratoire de Cristallographie Appliquée, Institut de Chimie, U.S.T.H.B., BAB-EZZOUAR 16111, Alger, Algérie.*

[2] *Laboratoire de Chimie du Solide du C.N.R.S., Université de Bordeaux I, 33405 TALENCE, France.*

Ferroelectric materials have been intensively studied during the last decades because they are of great interest for many practical applications. Electronic ceramics currently dominate applications and baryum titanate ($BaTiO_3$) is perhaps the best known example. Ferroelectrics are rapidly replacing low-dielectric materials in capacitors, computer memories and more exotic devices like phased-array radar (1-3). The purpose of the present work is to sinter baryum titanate perovskite at low temperature ($t_{sint.} \leq 1000°C$) with the aid of fluorides and to determine the effect of the additives on the dielectic properties of $BaTiO_3$.

The ceramic microstructure was systematically characterized by a scanning electron microscopy observation performed on fractured samples. Dielectric measurements were carried out in the frequency and temperature ranges 50 - 4.10^7Hz and 150 - 450K, respectively. All measurements were computer controlled. At frequencies from 50 to 3.10^5Hz the permittivity ε'_r exhibits a high maximum (>7000) at 283K, which is independent of the frequency. At higher frequencies (>10^6Hz) a dielectric relaxation is observed. A minimum of the relaxation frequency and a maximum of the dielectric dispersion appear at each phase transition temperature.

REFERENCES

(1) E. FUJII and al., *IEDM Conference*, San Francisco 14 December 1992, IEEE, New York, 137.
(2) Y. MOCHIZUKI, *Nikkei Microdevices*, March 1993, 82.
(3) J.F. SCOTT, *Physics World*, February 1995, 46.

5èmes Journées Maghrébines des Sciences des Matériaux (JMSM'96), HAMMAMET, Tunisie, 8 - 10 Novembre, 1996