

**92<sup>ND</sup>**  
ANNUAL  
MEETING

# ANNUAL MEETING ABSTRACTS

92nd ANNUAL MEETING AND  
EXPOSITION  
APRIL 22-26  
DALLAS, TEXAS

The American Ceramic Society, Inc.  
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Westerville, OH 43081-6136

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# Electronics Division

Room: W-115

Monday Morning • April 23  
Two Concurrent Sessions

## "Dielectrics & Capacitor Compositions, I"

Session Chair: Bharat S. Rawal, AVX Ceramics Corp., Myrtle Beach, SC 29577

7:55-8:00 a.m. Introductory Remarks by Session Chair

8:00-8:20 a.m.—(1-E-90)

PREPARATION AND CHARACTERIZATION OF BULK AND THIN FILM  $BaTiO_3$  CERAMICS, N.D.S. Mohallem and M. A. Aegerter (\*), IFQSC, University of Sao Paulo, 13.560 SAO CARLOS (SP), BRAZIL.

$BaTiO_3$  ceramics have been obtained from sols prepared by mixing Ba acetate, Tetraisopropyl orthotitanate and isopropanol under various pH conditions. Drying of the gels at 100°C leads to amorphous powders having an average grain size which increases with the sol pH. They crystallize into pure  $BaTiO_3$ , at 600°C. The influence of the sintering conditions (t, T) and pH on the electrical ( $\epsilon'$ ,  $\epsilon''$ ) mechanical ( $\rho$ , microhardness) and microstructure properties have been determined for axially pressed samples at 25°C. The highest dielectric constant measured at 25°C for bulk and thin film were 4000 and 100 respectively.

Research supported by CNPq, FAPESP and FINEP (Brazil).

8:40-9:00 a.m.—(3-E-90)

VARIATION OF THE XRD PATTERN OF  $BaTiO_3$  PREPARED FROM OXALATE PRECIPITATION PROCESS, K. Kuo\* and M. Chu, TAM Ceramics, Inc., Niagara Falls, NY; J. Bultitude, Cookson Group plc, Runnymede UK.

$BaTiO_3$  prepared from oxalate precipitation process showed different XRD patterns depending on the synthetic conditions. This study investigates the processing parameters which affect the XRD pattern. The dielectric properties are measured for the resultant  $BaTiO_3$  samples and the compositions prepared from them.

8:20-8:40 a.m.—(2-E-90)

MOLECULARLY MODIFIED ALKOXIDE PRECURSORS (MMA) FOR LOW TEMPERATURE SYNTHESIS OF ELECTRONIC CERAMIC POWDERS AND THIN FILMS

Pradeep P. Phule, Department of Materials Science and Engineering, University of Pittsburgh, Pittsburgh, PA 15261

Most sol-gel processes for fabrications of thin films and ultrafine powders of such ceramics as  $BaTiO_3$ , PZT and PLZT, suffer from the extreme moisture sensitivity and high cost of commonly used alkoxide precursors. We will present and discuss ways of alleviating these problems by achieving an intrinsic chemical control of

the alkoxide structure at a molecular level and using relatively inexpensive precursors. The chemistry of modifications will be discussed. Specific examples of applications of the MMA approach for fabrication of thin films and ultrafine powders of ferroelectric ceramics for such applications as nonvolatile memories and multilayer capacitors will be presented.

9:00-9:20 a.m.—(4-E-90)

EFFECT OF MOLTEN SALTS ON PHASE TRANSFORMATIONS IN CERAMIC POWDERS, Chen C. Li, Seshu B. Desu\*, and Chuen H. Peng, Department of Materials Engineering, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061

Significant reduction of the onset temperature ( $T_o$ ) of polymorphic transformations in ceramic powders were observed in the presence of molten salts, such as KCl, NaCl, or NaCl+KCl. For example, The  $T_o$ 's for anatase to rutile in  $TiO_2$  and rhombohedral to orthorhombic in  $PbNb_2O_6$  were lowered by molten salts from 950 to 800°C and 1150 to 800°C, respectively.

Moreover, the presence of molten salts significantly changed the morphology and average size of ceramic powders. The polymorphic transformation of anatase to rutile seems to be limited by nucleation and the character of mass transfer. The mechanisms responsible for lowering of  $T_o$  will be discussed.

\*Author making the presentation.

<b>Campo</b>	<b>Dado</b>
*****	Documento 1 de 1
No. Registro	000804217
Tipo de material	TRABALHO DE EVENTO-RESUMO - INTERNACIONAL
Entrada Principal	Mohallem, N D S (*)
Título	Preparation and characterization of bulk and thin film of 'BA"TI"O IND.3' ceramics.
Imprensa	Ohio : American Ceramic Society, 1990.
Descrição	p.193.
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Autor Secundário	Aegerter, M A
Autor Secundário	Annual Meeting of the American Ceramic Society (92. 1990 Dallas)
Fonte	Abstracts, Ohio : American Ceramic Society, 1990
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