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BOOK OF ABSTRACTS

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AKCongress
P.O. Box 245, H-1519 Budapest, Hungary
Phone: +36 1 464 8220
E-mail: ecers2017@akcongress.com

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P.O. Box 245, H-1519 Budapest, Hungary
Phone: +36 1 464 8240
E-mail: ak@akademiai.hu
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the high BSCF permeation properties. First the growth of films consisting of pure ionic and nanograined dual-phase structures was studied as a function of different deposition temperatures, and then the best films were grown on BSCF bulk membranes for permeation measurements under CO_2 containing atmospheres.

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Investigation of structural and functional properties of doped $BaTiO_3$ thin films for potential application in tunable microwave devices

Jelena Vukmirovic[1], Branimir Bajac[1], Jovana Stanojev[2], Jelena Bobic[3], Mirjana Vijatovic Petrovic[3], Elvira Djurdjic[4], Zeljka Cvejic[4], Vladimir V. Srdic[1]

[1]Faculty of Technology Novi Sad, University of Novi Sad, Serbia
[2]BioSense Institute, Novi Sad, Serbia
[3]Institute of Multidisciplinary Research, University of Belgrade, Serbia
[4]Faculty of Sciences, University of Novi Sad, Serbia

Keywords: barium titanate, dielectric properties

Ferroelectric behavior of perovskites makes these materials very popular for various applications in microelectronics. Barium titanate is one of the most popular representatives of perovskites and probably the most investigated material from these group. Addition of dopants such as strontium and zirconium can change ferroelectric nature of barium titanate. Different concentration of mentioned dopants has huge influence on barium titanate structural and functional properties. Aim of this work was to approach the paraelectric state of barium titanate for potential application in tunable microwave devices such as varactors, phase shifters, etc. Barium strontium titanate (BST) is mainly used for production of tunable devices, but some other materials as barium zirconium titanate (BZT) can be also interesting for investigation. Precursor solutions were made from barium carbonate and tetrabutylorthotitanate, and as sources of Sr^{2+} and Zr^{4+} were used strontium acetate and zirconium (IV) oxychloride octahydrate, respectively. Acetic acid and 2-methoxy ethanol were used as solvents. Prepared sols were used for production of multilayered thin films with spin coating method on silicon and platinized (bottom electrode) substrates. After thermal treatment on

different temperatures (750, 900, 1000 °C), prepared samples were structurally characterized by X-ray diffraction, Raman spectroscopy and scanning electron microscopy. After structural characterization samples were prepared for functional measurements and gold electrodes were deposited on top. Dielectric properties were measured with LCR meter, up to 1 MHz. We also measured ferroelectric properties.

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Aqueous TAPE casting of transparent yttrium aluminum garnet doped with neodymium (Nd:YAG) or chromium (Cr:YAG) ceramics

Anna Wajler[*], *Helena Węglarz, Agata Sidorowicz*

Department of Ceramics, Institute of Electronic Materials Technology, Wolczynska 133
01-919 Warsaw, Poland; [*]e-mail: anna.wajler@itme.edu.pl

Keywords: yttrium aluminun garnet, tape casting, transparent ceramics

One of the advantages of ceramic manufacturing process over single crystals is a feasibility of obtaining composite multilayered structures aimed at optimizing of the thermal properties and lowering optical losses of laser materials. According to the current knowledge the typical examples of the composite ceramic laser materials are cylindrical clad-core structures or a layered structures. This latter can be conveniently produced by tape casting and laminating. This method also, as a one of the colloidal forming techniques, is more attractive processes for manufacturing transparent YAG ceramics than dry pressing.

The main objective of this work was fabrication and characterization of YAG/Nd:YAG, Cr:YAG/Nd:YAG layered-composite ceramics with the use of aqueous-suspensions tape casting. The effect of ceramics foils preparation parameters, laminating and sintering conditions on the and microstructure and optical properties of Nd:YAG and Cr:YAG ceramics was studied. Also composite YAG/Nd:YAG, Cr:YAG/Nd:YAG ceramics were fabricated and their properties have been studied and described.

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