

**The Serbian Ceramic Society  
Vinča Institute of Nuclear Sciences, University of Belgrade  
Institute for Multidisciplinary Research, University of Belgrade  
Institute of Physics, University of Belgrade**

# **PROGRAM AND THE BOOK OF ABSTRACTS**

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## CHEMICAL STABILITY AND ELECTRICAL PROPERTIES OF Nb DOPED $\text{BaCe}_{0.9}\text{Y}_{0.1}\text{O}_{3-\delta}$ AS A HIGH TEMPERATURE PROTON CONDUCTOR FOR IT-SOFC APPLICATION

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$\text{BaCe}_{0.9-x}\text{Nb}_x\text{Y}_{0.1}\text{O}_{3-\delta}$  (where  $x = 0.01, 0.03$  and  $0.05$ ) fine powders were synthesized by auto-combustion reaction to investigate the influence of Nb concentration on chemical stability and electrical properties of  $\text{BaCe}_{0.9}\text{Y}_{0.1}\text{O}_{3-\delta}$ . The dense electrolyte pellets were formed from powders after being uniaxially pressed and sintered at  $1600^\circ\text{C}$  for 5h. Chemical stability in a  $\text{CO}_2$  atmosphere at  $750^\circ\text{C}$  was determined by X-ray powder diffraction. Conductivities of the sintered samples have been measured within the temperature range of  $500\text{-}750^\circ\text{C}$  in different atmospheres (dry and wet argon, wet hydrogen). The highest conductivities were obtained at  $750^\circ\text{C}$  in wet hydrogen reaching the value of  $3,26 \cdot 10^{-3} \text{Sm cm}^{-1}$ .

## SYNTHESES OF Pb-CERAMIC FROM ZEOLITE PRECURSORS: XRPD REFINEMENT AND SEM/EDS ANALYSIS

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The Pb-ceramic was synthesized by process of thermally induced phase transformation of Pb-exchange LTA and FAU zeolites. Both frameworks collapse into amorphous intermediate products after heating between  $600$  and  $650^\circ\text{C}$ . Prolonged heating of the intermediate product over  $1100^\circ\text{C}$  results directly in formation of a disorder Pb feldspar<sub>LTA</sub> [ $a=8.4171(4) \text{ \AA}$ ,  $b=13.0532(4) \text{ \AA}$ ,  $c=7.1722(4) \text{ \AA}$ ,  $\beta=115.35(3)^\circ$ ] and Pb-feldspar<sub>FAU</sub> [ $a=8.426(4) \text{ \AA}$ ,  $b=13.0608(4) \text{ \AA}$ ,  $c=7.1773(4) \text{ \AA}$ ,  $\beta=115.36(3)^\circ$ ] phase. The phase conversions in the temperature range investigated were followed by thermal (DTA/TGA), XRPD, and SEM/EDS analyses. The results showed that the Pb-ceramic could be obtained by process of thermally induced phase transformation of Pb-exchange zeolites.