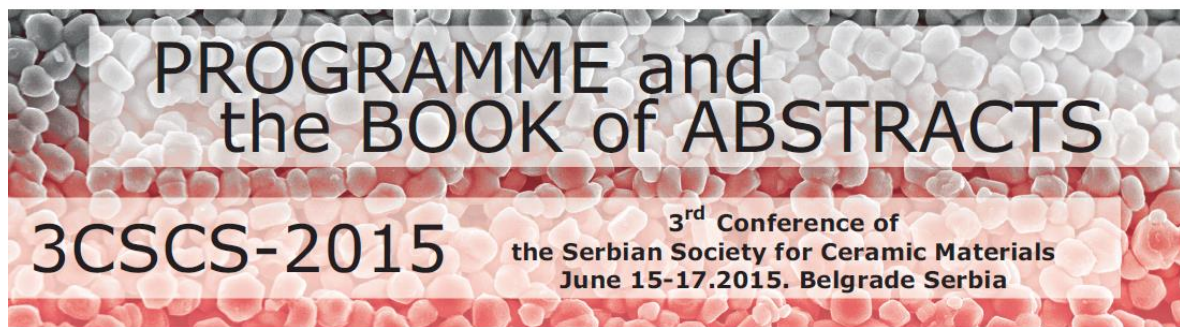


The Serbian Society for Ceramic Materials
The Academy of Engineering Sciences of Serbia
Institute for Multidisciplinary Research - University of Belgrade
Institute of Physics - University of Belgrade
Vinča Institute of Nuclear Sciences - University of Belgrade



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MECHANICAL PROPERTIES OF POROUS CERAMIC MONOLITHS BASED ON DIATOMITE

Maja Kokunešoski¹, Jelena Majstorović², Jovana Ružić¹, Branko Matović¹, Svetlana Ilić¹, Adela Egelja¹, Aleksandra Šaponjić¹

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Diatomite from surface coal mine Kolubara, Serbia, was used as a silica source. Firstly, diatomite was purified from organic and inorganic impurities by the heat and chemical treatments. Secondly, boric acid was used as a sintering aid up to 2 wt%. So, after using different pressures of 40, 60, and 80 MPa, the compacted samples were sintered at 850, 1000, 1150, and 1300 °C for 4 h in air. A relatively high porosity in the range of 60-70% is obtained for the samples pressed at the applied pressures and sintered at 1000 °C. The relations between mechanical properties like Young modulus, Poisson ratio, and compressive strength versus content of boric acid in the investigated samples were studied and discussed. Young modulus increases with lowering porosity in the samples sintered at 1300 °C, while Young modulus of the samples sintered at 1150 °C are assumed to be almost linear function of the forming pressure. Compressive strength of the observed samples is higher for the samples sintered at 1300 °C in comparison with the samples sintered at 1150 °C.

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STRUCTURAL AND ELECTRONIC PROPERTIES OF PSEUDOBROOKITE

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Starting powders of TiO₂ (anatase) and Fe₂O₃ (hematite) were mixed in the molar ratio 1:1. Pseudobrookite powder was obtained by a combined milling/calcination procedure. Particle size distribution was analyzed on a laser

particle size analyzer and correlated with XRD and SEM analysis. The band gap was determined using UV/Vis spectroscopy. Green samples were sintered in a dilatometer and at 1000°C for 2h in air. Thermal diffusivity was determined from photoacoustic measurements. Electrical conductivity measurements were performed. The aim was to obtain pseudobrookite with properties suitable for polymer paste for thick films to be applied as gas sensors.

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**SAFE TRAPPING OF Cs RADIONUCLIDES IN THERMALLY
TREATED MATRIX OF NATURAL ZEOLITE-
CLINOPTILOLITE**

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Cesium aluminosilicate phases are of the great interest as possible hosts for Cs immobilization in radioactive waste management. Cs-exchanged form of natural zeolite-clinoptilolite was prepared by standard procedure. Powder and cold pressed powder of Cs-exchanged clinoptilolite samples were heated at 1200 °C and compared. After thermal treatment, both Cs-exchanged clinoptilolite samples (non-sintered and sintered) showed satisfactory Cs ions retention during leaching test. Obtained results indicate that these cesium aluminosilicate ceramic forms are promising for the permanent immobilization of Cs radionuclides.