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

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FABRICATION ZrO_2 AND ZrO_2/SiC BY CARBOTHERMAL-REDUCTION REACTIONS OF $ZrSiO_4$

Ljiljana Kljajević[1], Branko Matović[1], Snežana Nenadović[1], Nikola Cvetićanin[2], Aleksandar Devečerski[1]

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The synthesis of zirconia/silicon carbide (ZrO_2/SiC) and ZrO_2 powders are obtained by carbothermal reduction of natural mineral zircon ($ZrSiO_4$). The influence of carbon to $ZrSiO_4$ ratio is investigated for a three range of compositions (C/ZrSiO4 = 3, 5 and 7) and temperatures (1473–1973 K). The zircon powder was mixed with activated carbon as a reducing agent and heat treated in a controlled flow atmosphere of Ar. Phase evaluation and phase content were followed as a function of temperature and C/$ZrSiO_4$ ratio. The obtained powders were characterized by means of ex-situ X-ray diffraction and SEM/EDS investigation.

PROPERTIES OF SBA-15 / CARBON CRYOGEL NANOCOMPOSITES AS A FUNCTION OF SYNTHESIS CONDITIONS

Maja Kokunešoski, Branko Matović, Biljana Babić

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Ordered mesoporous silica SBA-15 materials were synthesized by using Pluronic P123 (non-ionic triblock copolymer, $EO_{20}PO_{70}O_{20}$) as a template, under acidic conditions. SBA-15 / carbon cryogel composites were obtained by the sol-gel polycondenzation of resorcinol and formaldehyde, in the presence of different amount of SBA-15, followed by freeze drying, and subsequent pyrolysis. These materials were characterized by nitrogen adsorption-desorption measurements, X-ray diffraction and scanning electron microscopy. Samples have high specific surface (350-520 $m^2\ g^{-1}$), developed meso- and microporosity and amorphous structure. Porous structure is function of the silica/carbon ratio and can be controlled by concentration of starting solution.