Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION IX
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Technical Sciences of SASA
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 20-21. September 2021.

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monitored for the evaluation of cavitation resistance. The level of degradation of the surface of the sample was quantified using the image analysis. The change in the morphology of the sample surface with the test time was followed by scanning electron microscopy. In the case of raw basalt samples it is evident that the incubation period in the early phase of cavitation damage is short, because the period without mass loss is almost negligible. According to the selected test conditions in the first 15 min, the mass loss of these samples is up to 15 mg, for 120 min exposure is 88,5mg, with a cavitation rate of 0,7 mg/min and total surface area damage of 35%. Analyzing the progression of erosion samples of glass-ceramics, it can be concluded that the loss of mass is small, in the first 15 min the mass loss is 1,29 mg, for 120 min exposure is 3,53 mg, with a cavitation rate of 0.03 mg/min and total surface damage of the sample surface of 12%. The higher erosion rate of the raw basalt samples compared to glass-ceramic samples based on basalt can be interpreted by the rough structure of the olivine-pyrroxene basalt from Vrelo-Kopaonik deposit, compared to the compact structure of the obtained glass-ceramic samples, with glass and fluid texture, very great hardness. Research has shown that the process of obtaining samples of glass-ceramic greatly influences cavitation resistance, especially relaxation cooling processes that eliminate internal stresses and reduce brittleness of samples. It has been shown that glass-ceramic samples based on olivine-pyrroxene basalt from the test deposit can be applied in conditions in which high cavitation loads are expected.

P

Study of iodine (n) and tin (p) doped Sb_2S_3 nanoparticles by detail X-ray photoelectron spectroscopy

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X-ray photoelectron spectroscopy (XPS) measurements were used for analyzing the incorporation of iodine (I) and tin (Sn) into the stibnite (Sb_2S_3) lattice obtained *via* the hot-injection method. The X-ray diffraction (XRD) technique revealed the visible presence of one phase, the pure orthorhombic structure of Sb_2S_3 with the *Pnma* group. Scanning electron microscopy (SEM) showed long columnar structures with length of few nanometers and diameter of about 150 nm.The incorporation of I and Sn into Sb_2S_3 was verified by comparing the XPS spectra of the non-doped Sb_2S_3 and iodine and tin-doped samples, by the distinctive appearance of characteristic *3d* peaks of iodine and tin. As well, the relative amounts of I and Sn dopants were determined from the I $3d_{5/2}$ and Sn $3d_{5/2}$, respectively. The obtained, lesser than expected, amount of dopants is likely due to a possible weakening of I and Sn signals. Shifting of the valence band towards higher (I-doped Sb_2S_3) or lower (Sn-doped Sb_2S_3) energies, related to the non-doped sample, also confirmed the successful incorporation of dopant atoms in the Sb_2S_3 lattice.