

Abstract Submitted
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Shock Response and Structure Of Yttria-Doped Tetragonal Zirconia¹ VLADIMIR MILYAVSKIY, JIHT RAS, ANDREY SAVINYKH, IPCP RAS, FELIX AKOPOV, LEONORA BOROVKOVA, GEORGY VALIANO, TATIANA BORODINA, JIHT RAS, EVGENY LUKIN, NELIA POPOVA, MUCTR, Russia, VADIM ZIBOROV, JIHT RAS — A new technology of ceramics manufacturing is proposed. The technology is based on zirconium dioxide, partially stabilized by yttria, obtained by a heterophased chemical deposition method. The main properties of the manufactured ceramics have been characterized by us: density of $5.79 \text{ g}\cdot\text{cm}^{-3}$, bending strength of $\sim 800 \text{ MPa}$, crack resistance of $\sim 8 \text{ MPa}\cdot\text{m}^{0.5}$, microhardness of $\sim 15 \text{ GPa}$. The microstructure and phase composition have been also investigated. The average size of sintered ceramic grains was 0.6 micron. It was established that the ceramics consisted of 93 mass % tetragonal and 7 mass % monoclinic phase and had X-ray density of $6.18 \text{ g}\cdot\text{cm}^{-3}$. We have obtained longitudinal and transversal sonic speed relation to the frequency range of 1.25 – 10 MHz. The measurements have shown dispersion occurrence. At dynamic loading the PSZD ceramics had shown high efficiency in Hugoniot elastic limit and spall strength.

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