The Serbian Society for Ceramic Materials
Institute for Multidisciplinary Research (IMSI), University of Belgrade
Institute of Physics, University of Belgrade
Center of Excellence for the Synthesis, Processing and Characterization of Materials for use in Extreme Conditions "CEXTREME LAB" - Institute of Nuclear Sciences "Vinča", University of Belgrade
Faculty of Mechanical Engineering, University of Belgrade
Center for Green Technologies, Institute for Multidisciplinary Research, University of Belgrade
Faculty of Technology and Metallurgy, University of Belgrade
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Edited by:
Branko Matović
Zorica Branković
Aleksandra Dapčević
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Dr. Zorica Branković
Prof. Aleksandra Dapčević
Prof. Vladimir V. Srdić

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THEORETICAL AND EXPERIMENTAL STUDY OF POLYCRYSTALLINE PHASES OBTAINED BY THE NANOMETRIC $ZnTiO_3$ POWDER SINTERING

Nebojša Labus[1], Milena Rosić[2], Maria Čebela[2], Dragana Jordanov[2], Vladimir Dodevski[2], Ivana Radović[2]

[1]Institute of Technical Sciences of SASA, Knez Mihailova 35, 11000 Beograd, Serbia
[2]Laboratory for Material Science, Institute of Nuclear Sciences „Vinča", University of Belgrade, Serbia

In this study we have combined two research methods: structure prediction of $ZnTiO_3$ using computational SPuDS software, and the characterization of binary oxides obtained from ZnO TiO_2 system. Pure nanosized $ZnTiO_3$ (99.5%), was compacted in cylindrical shape specimens by uniaxial double sided compaction and then sintered in air atmosphere in a dilatometric device [1,2]. One compact was sintered up to 915 °C to retain metastabile $ZnTiO_3$ and held 5 minutes on that temperature, and another one at the same conditions, but now up to 970 °C to induce phase transition and to obtain stabile Zn_2TiO4 and TiO_2 according to phase diagram [2]. Reheated samples obtained at different characteristic temperatures in air were analyzed by X-ray diffraction (XRD). The infrared attenuated total reflectivity measurements confirmed XRD results. In order to estimate theoretical stability of these perovskite structure, Goldschmidt tolerance factor Gt and global instability index GII were calculated. Furthermore, the Ti valence states were determined by bond valence calculations (BVC). Also, we have investigated the formation of new phases ($Zn_2Ti_3O_8$, TiO_2 and Zn_2TiO_4) originating from $ZnTiO_3$ with temperature change, as well as the relation between the crystal structures which have been predicted and the structure of the phases we have experimentally observed.

1. N. Labus, J. Krstić, S. Marković, D. Vasiljević-Radović, MV. Nikolić, V. Pavlović, $ZnTiO_3$, *Sci. Sintering*, **45** (2013) 209
2. J. Yang, J.H. Swisher, *Mater. Character*., **37** (1996) 153