Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION XI
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, 18-20. September 2023.

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Book title: Serbian Ceramic Society Conference - ADVANCED CERAMICS AND APPLICATION XI Program and the Book of Abstracts

Publisher:
Serbian Ceramic Society

Editors:
Dr. Nina Obradović
Dr. Lidija Mančić

Technical Editors:
Dr. Adriana Peleš Tadić
Dr. Jelena Živojinović

Printing:
Serbian Ceramic Society, Belgrade, 2023.

Edition:
120 copies

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

666.3/.7(048)
66.017/.018(048)

SRPSKO keramičko društvo. Conference Advanced Ceramics and Application : New Frontiers in Multifunctional Material Science and Processing (11 ; 2023 ; Beograd)

Program ; and the Book of abstracts / Serbian Ceramic Society Conference Advanced Ceramics and Application XI New Frontiers in Multifunctional Material Science and Processing, Serbian Academy of Sciences and Art Serbia, Belgrade,18-20.September 2023. ; [editors Nina Obradović, Lidija Mančić]. - Belgrade : Serbian Ceramic Society, 2023 (Belgrade : Serbian Ceramic Society). - 90 str. : ilustr. ; 30 cm

Tiraž 120.

ISBN 978-86-905714-0-6

а) Керамика -- Апстракти б) Наука о материјалима -- Апстракти

COBISS.SR-ID 122849545

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samples and structural changes, induced by the presence of BT, were analyzed through SEM-EDS analysis. XRD analysis was performed for additional structural investigation. Research findings indicate a significant increase in tensile strength with BT, likely due to interactions between BT and the polymer matrix. These results underscore the potential for enhancing the mechanical properties of multifunctional films through controlled addition of BT. This research contributes to understanding the role of BT as a reinforcing factor in mechanical properties, opening perspectives for applications in various technical and technological fields. Further work should focus on a detailed analysis of the interaction mechanisms between BT and the polymer matrix to better comprehend the basis for improved tensile strength. Additionally, optimizing formulations of multifunctional films can enable adaptable applications in specific engineering scenarios. In conclusion, this study provides valuable insights into enhancing the mechanical properties of complex films through strategic BT addition, paving the way for innovative technical applications in the future.

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Kinetic of the $ZnTiO_3$ to Zn_2TiO_4 phase transition observed on nano dimensional powder and polycrystalline bulk specimen using thermal analysis - DTA and dilatometer

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Phase transition from $ZnTiO_3$ to Zn_2TiO_4 represents second order phase transition from perovskite (zinc metatitanate) with a hexagonal ilmenite structure ($R\bar{3}$) to inverse spinel (zinc orthotitanate) cubic structure ($Fd\bar{3}m$) stable from room temperature to its melting (liquid) was identified during sintering of $ZnTiO_3$ nanopowder. Kinetic of the phase transition has been observed as dimensional changes using dilatometric device thermo-mechanical analyzer TMA SETARAM model SETSYS Evolution and as thermal changes with SETARAM SETSYS Evolution TGA-DTA/DSC device. Two forms of specimens were employed nanopowder and polycrystalline sintered bulk specimen. It was found that sintering process and relaxation of the nanodimensional powder particles stress phenomena strongly influence kinetic of the phase transition. Dilatometric results known from previous investigations are now compared with differential thermal analysis results.