

Electroceramics XVII

International Conference Virtual Darmstadt

24 – 28 August 2020

BOOK OF ABSTRACTS



TECHNISCHE
UNIVERSITÄT
DARMSTADT

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Band-gap engineering of BiFeO₃ based powders. Influence on photocatalytic properties

Oral

Dr . Nikola Ilic¹, Dr . Jelena Bobic¹, Dr . Mirjana Vijatovic Petrovic², Dr . Adis Džunuzović¹, Prof . Biljana Stojanović³

1. Institute for Multidisciplinary Research, University of Belgrade, Kneza Visislava 1, Belgrade, Serbia , 2. Institute for Multidisciplinary Research, University of Belgrade , 3. Academy of Engineering Sciences of Serbia, Belgrade

Bismuth ferrite (BiFeO₃) is studied a lot in recent years because of its specific structure and potential to act as single phase multiferroic well above the room temperature. Thanks to the optical band gap energy of 2.3-2.8 eV BiFeO₃ is also an interesting material for photocatalytic and solar energy applications. Sol-gel and solid state methods were used to synthesize BiFeO₃-based powders. Two main methods would be used to modify the band gap. First one is incorporation into composite materials with contribution of phase boundaries formed between different phases of bismuth-iron oxides or BiFeO₃ and silica-based substrate powders. Second one is modification of powders by milling them with organic compounds in order to get defects and oxygen vacancies. Composition, structure and microstructure of such way obtained powders were conducted and their influence on variations in band-gap energy studied. Visible and UV-Vis light photocatalytic activity of synthesized materials for decomposition of methylene blue solutions was tested and optimal composition and preparation route for this application proposed, as well as the present mechanisms of adsorption and photocatalytic reaction.