

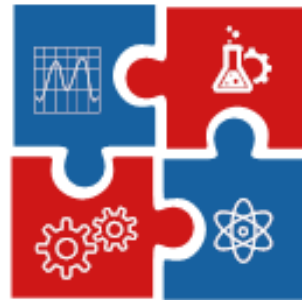
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**CNN TECH**

**„International Conference of Experimental and  
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**Programme  
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**05 – 08 July 2022**

**Zlatibor, Serbia**

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# **CNN TECH 2022**

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# INFLUENCE OF MN DOPING ON THE EVOLUTION OF MICROSTRUCTURE AND OPTICAL PROPERTIES OF MECHANICALLY ACTIVATED $\text{SrTiO}_3$ POWDERS

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## Abstract

*Manganese doped  $\text{SrTiO}_3$  powders with various manganese dioxide weight percentages in the range of 1.5, 3 and 6 wp% were prepared by a solid-state method in the presence of mechanical activation (10, 30 and 120 minutes). A systematic investigation by X-ray diffraction (XRD), scanning electron microscopy (SEM), particle size analysis (PSA), Brunauer-Emmett-Teller (BET) methods and Raman spectroscopy has been undertaken to evaluate the role of dopants on the microstructural and morphological study of the perovskite oxide obtained. The optical properties of the different manganese doped and activated  $\text{SrTiO}_3$  powders have been also evaluated. Mn insertion in  $\text{SrTiO}_3$  is discussed considering the possibility for Mn ions to occupy both  $\text{Ti}^{4+}$  and  $\text{Sr}^{2+}$  sites as well as manganese segregation and Mn incorporation-related non-homogeneities. The results demonstrated that Mn has substituted into the lattice and surface layers of the particles of  $\text{SrTiO}_3$  powders and the absorption onset shifted to higher values of wavelengths with increasing time of activation and dopant concentration. The lowest value of the band gap ( $E_g=3.10$  eV) was registered with the longest activation for 120 minutes and the highest concentration of dopant (6 wp%). Combining doping with mechanical activation lower values of band gap can be achieved and that fact could be used in subsequent studies to make Mn- $\text{SrTiO}_3$  more suitable visible-light photocatalysts.*

## Keywords

Mn-doped  $\text{SrTiO}_3$  powders, mechanical activation, structural and optical properties.

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