



Contribution ID: 40

Type: **Poster Presentation**

The role of Zn^{2+} ion on the optical properties of novel $Ba_{1-x}Zn_xZrO_3$: Mn perovskite

Tuesday, 4 July 2017 17:10 (1h 50m)

This work presents the effect of Zn^{2+} ion concentration on the optical properties of a newly formulated perovskite with or without a dopant. The $Ba_{1-x}Zn_xZrO_3$ perovskite was synthesized using the solution combustion technique. The scanning electron micrographs show particles with irregular shapes which agglomerated into a dense structure. The sizes of the particles were in the range 30 to 75 nm. X-ray diffraction measurement gave pure cubic perovskite structure at all concentrations of the Zn ion. Photoluminescence excitation spectra show a slight red-shift of the excitation band due to the presence of Zn^{2+} ions. The doped perovskite show strong emission of Mn^{2+} ion at 585 nm and the intensity of this band increases with increasing concentration of Zn^{2+} ion. The possible reason for this enhancement of emission intensity of Mn^{2+} ion is the substitution of the ion at Zn^{2+} ion's site due to the similarity of their ionic radii. The International Commission on Illumination (CIE) coordinates confirm the orange-light emission of the doped perovskite. The $Ba_{1-x}Zn_xZrO_3$ host can be effectively applied in solar cells, photocatalysis and as a host matrix for efficient phosphors. The $Ba_{1-x}Zn_xZrO_3$: Mn perovskite is therefore is a good orange-coloured light emitter which can be effectively excited by a near UV source such as LED.

Summary

perovskite, orange light, combustion synthesis, photoluminescence, optical properties

Primary author: Dr AHMEN, Iorkyaa (University of The Free State Qwqwa Campus)

Co-author: Prof. DEJENE, F.B. (University of the Free State South Africa)

Presenter: Prof. DEJENE, F.B. (University of the Free State South Africa)

Session Classification: Poster Session 1

Track Classification: Track A - Division for Physics of Condensed Matter and Materials