



Contribution ID: 400

Type: Oral Presentation

Structural and Optical Characterisation of Double-Doped TiO₂ Nanoparticles

Thursday, 10 July 2014 15:20 (20 minutes)

Abstract content
 (Max 300 words)

With titanium isopropoxide as the precursor, single and double doped nanosized powders of TiO₂ were synthesised by the sol-gel process. The metal dopants used were Ag, Cu and Fe at doping levels of 5% (molar weight). The post annealing of the samples was done at 300 °C, 600 °C and 900 °C after drying them at 100 °C in air. Structural characterisation of the samples was carried out by X-ray Diffraction (XRD), Raman and scanning Electron Microscopy (SEM) techniques. The results suggests that the co-doped TiO₂ powders are constituted by both the anatase and brookite phases (with the dopant particles incorporated into the TiO₂ matrix) whereas only anatase is observed in the case of pure and singly doped samples (with the dopants residing on the TiO₂ surface). The co-existence of brookite with anatase in the co-doped sample is thought to be responsible for the enhancement of anatase to rutile transformation. Photoluminescence (PL) and UV-visible measurements were done to study the optical properties of the TiO₂ nanoparticles. This revealed the active PL band at around 440 nm. Double doping was found to enhances the narrowing of the band gap, over single doping.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD)?

PhD

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

Primary author: Mr NUBI, Olatunbosun (University of Limpopo)

Co-authors: Prof. RAMMUTLA, Erasmus (University of Limpopo); Dr MOSUANG, Thutho (University of Limpopo)

Presenter: Mr NUBI, Olatunbosun (University of Limpopo)

Session Classification: DPCMM1

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