



Contribution ID: 165

Type: Oral Presentation

## A Mössbauer effect investigation of nanosized $\text{Mn}_x(\text{Mg, Co})_{0.5-x}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$

Wednesday, 10 July 2013 15:40 (20 minutes)

### Abstract content <br> &nbsp; (Max 300 words)

In this paper we report Mn substitution in Zn-Mg and Zn-Co spinel oxides. Single phase nanoferrite powders bearing the chemical formula  $\text{Mn}_x\text{Mg}_{0.5-x}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$  and  $\text{Mn}_x\text{Co}_{0.5-x}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$  (in steps of 0.1) have been produced by co-precipitation technique. The compounds were characterised by X-ray diffraction, Mössbauer and VSM measurements. The particle size varies between 9 nm and 15 nm. The variation of Mn concentration has significant effects on the structural and magnetic properties. <sup>57</sup>Fe Mössbauer effect spectra show ordered magnetic spin state in all the  $\text{Mn}_x\text{Co}_{0.5-x}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$  compounds. Transformation from ordered to disordered magnetic state has been observed with increasing x in  $\text{Mn}_x\text{Mg}_{0.5-x}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$ . The variation of the magnetic parameters such as coercive fields and saturation magnetization as a function of Mn concentration is also presented.

### Apply to be<br> considered for a student <br> &nbsp; award (Yes / No)?

No

### Level for award<br>&nbsp;(Hons, MSc, <br> &nbsp; PhD)?

PhD

### Main supervisor (name and email)<br>and his / her institution

Dr. J.Z. Msomi, Msonij1@ukzn.ac.za, University of KwaZulu-Natal

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

Yes

**Primary author:** Ms DLAMINI, Wendy Bonakele (School of Chemistry and Physics, University of KwaZulu-Natal, P/bag X54001, Durban 4000, South Africa)

**Co-authors:** Dr MSOMI, Justice (School of Chemistry and Physics, University of KwaZulu-Natal, P/bag X54001, Durban 4000, South Africa); Dr MOYO, Thomas (School of Chemistry and Physics, University of KwaZulu-Natal, P/bag X54001, Durban 4000, South Africa)

**Presenter:** Ms DLAMINI, Wendy Bonakele (School of Chemistry and Physics, University of KwaZulu-Natal, P/bag X54001, Durban 4000, South Africa)

**Session Classification:** DCMPPM2

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