



Contribution ID: 102

Type: Poster Presentation

## Synthesis and characterization of binary phase NiS nanostructures

Wednesday, 9 July 2014 17:10 (1h 50m)

**Abstract content** &nbsp; (Max 300 words) <a href="http://events.saip.org.za/getFile.py/target=\_blank">Formatting & Special chars</a>

Nickel and sulphur form various polymorphs which include NiS, NiS<sub>2</sub>, Ni<sub>3</sub>S<sub>4</sub>, Ni<sub>9</sub>S<sub>8</sub>, Ni<sub>7</sub>S<sub>8</sub> and Ni<sub>3</sub>S<sub>2</sub>. Nickel monosulphide (NiS) exhibit hexagonal and rhomboherdal phases which have interesting electrical and catalytic properties. As such, NiS has been studied for potential applications in lithium ion batteries, hydrodesulfurization catalyst and in IR detectors. NiS is one of the materials that show a metal to insulator transition at approximately 260 K. Soft chemical routes are being employed extensively to synthesize inorganic nanomaterials. Methods that have been used to make NiS nanomaterials include slow precipitation method, single source precursor route and microwave-assisted hydrothermal route. In this paper we report NiS nanostructures that were synthesized using a microwave-assisted hydrothermal technique. Solvent type as well as NiS precursors were varied in order to investigate their effect on the various structures as well as phase distribution of Ni:S at 1:1 ratio. Both XRD and HR-TEM techniques were employed to investigate the phase and the size distribution of the products. Hexagonal nano-size platelets, nano-spheres, nano-sheets, nano-wires and nano-rods were obtained when different precursors and/or solvents were used

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

No

**Level for award (Hons, MSc, PhD)?**

PhD

**Main supervisor (name and email) and his / her institution**

Dr B Mwakikunga

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

Yes

**Primary author:** Ms LINGANISO, Ella (CSIR)

**Presenter:** Ms LINGANISO, Ella (CSIR)

**Session Classification:** Poster2

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