Contribution ID: **43** Type: **Poster Presentation**

Synthesis and characterization of LiMn2O4 nanostructures prepared by modified chemical bath method

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

LiMn2O4 powders were prepared by modified chemical bath method using citric acid (CA) a catalyst. The ratio of Li and Mn on LiMn2O4 was varied, respectively. The effect of molar ratio of Li and Mn on the thermal analysis, structure, morphology and optical properties of LiMn2O4 nanostructures were investigated, respectively. The thermogravimetric analyses (TGA) and differential scanning calorimeter (DSC) showed that the final yield decreases with an increase in the annealing temperature. The best thermal stability of LiMn2O4 nanopowders were obtained at Li:Mn:CA ratio of 2:1:10. The X-ray diffraction (XRD) results showed that the structure of spinel LiMn2O4 powders were obtained at molar ratio of 2:1:10 (Li:Mn:CA). Further increase in the molar ratio of Li and Mn respectively, there was formation of Mn2O3 structure. At low molar ratio of Li and Mn, respectively there was formation of spinel LiMn2O4 structure with the secondary phases. The estimated average grain sizes calculated using the XRD spectra were found to be in the order of 83 ± 1 nm for the LiMn2O4 powders prepared at molar ratio of 2:1:10 (Li:Mn:CA). The surface morphology study revealed the irregular nanoparticle. By varying the molar ratio of Li and Mn respectively, there was effect on morphology. The UV-Vis spectra showed that at low molar ratio of Li and Mn there are two broad peak at around 600 an 800 nm. Those peaks may be due to secondary phases because they disappear at single phase of spinel LiMn2O4 and Mn2O3 structures. Lithium ion batteries are widely used in portable equipment, such as mobile phone, notebook computer, electron instrument, and so on.

Primary author: Dr KOAO, Lehlohonolo (UFS (Qwa Qwa))

Co-authors: Dr KEBEDE, Mesfin (Council for Scientific and Industrial Research); Dr MOTLOUNG, Setumo (SMU); Mr MOHAPI, Thebe (Vaal University of Technology); Prof. MOTAUNG, Tshwafo (Unizulu)

Presenter: Dr KOAO, Lehlohonolo (UFS (Qwa Qwa))

Session Classification: Poster Session 1

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