Mesfin Kebede, J Nanomed Nanotechnol 2016, 7:3(Suppl)
http://dx.doi.org/10.4172/2157-7439.C1.034

7th World Nano Conference

Nanostructured $LiMn_2O_4$ cathode materials for efficient lithium ion battery energy storage systems

Mesfin Abayneh Kebede
CSIR, South Africa

Nanowire/nanorod architectured electrode(cathode & anode) materials for lithium ion battery have shown significant enhanced electrochemical performance. Lithium ion battery (LIB) has started to penetrate into power sources for electric vehicles and electric energy storage as the need for clean and renewable energy reaches climax. To fully meet the target of using LIBs for electric vehicle suitable electrode materials with high energy and high power density have to be achieved. To date numerous cathode and anode materials have been developed which can deliver high energy and high power density. One of them is high voltage $LiMn_2O_4$ can perfectly suit with this purpose, however it suffer sever capacity fading which hinders it to meet the target. Interestingly, the use of nano-architecturing of electrode materials (both cathode and anode) has shown a very promising result to sustain the capacity of the materials with significantly minimized fading. Bulk $LiMn_2O_4$ cathode materials are characterised by capacity fading in maintaining only about less than 50% of their initial capacity after 100cycles. By synthesizing nanowire $LiMn_2O_4$ their capacity retention increases significantly to about 85% after 100cycles. In our laboratory we sysnthesized $LiMn_2O_4$ nanorod cathodes from South African manganese precursor source and they retained 95% after 100cycles. In this talk the advancement of nanostructured cathode and anode materials for LIBs application will be reviewed and our contribution in this regard will also be presented.

Biography

Mesfin Kebede has completed his PhD in 2009 in Materials Science and Enginering from Inha University South Korea and postdoctoral studies from UFS & CSIR in South Africa. He is currently a senior researcher at CSIR. He has been studying and researching nanostructured materials properties and applications as electrodes for lithium ion battery, gas senosor, luminescent and photoluminescence, photocatalysis for almost a decade. He has authored 2 book chapters and more than 35 papers in reputed journals and has been serving as reviewer for several journals and he also serves as editorial board member.

MKebede@csir.co.za

Notes: