OP-A-131

Thursday, May 12, 2011, 03:35-03:55 pm
Room: Fez 1

# SYNTHESIS AND CHARACTERIZATION OF ELECTROSPUN CONDUCTING POLYIMIDE/SWCNT COMPOSITE NANOFIBROUS ELECTRODES FOR ENERGY STORAGE DEVICES

[1]B. Mansoor Akhthar, [2]T.V.Muhammed Suhail , [2]R.VasanthaKumari , [3]T.S. Natarajan

*1Department of Materials science and Engineering,University of Florida, Gainesville, USA, 2Department of Polymer Technology, B.S.A.Crescent Engineering College,Anna University, Chennai ,India and 3Department of Physics, IIT Madras, Chennai, India.*

The current research work is focused towards the development of electrically conducting and high temperature resistant nanocomposite polyimide fibres . A novel class of polymer namely Pyromellitic dianhydride (PMDA) - Oxydianiline (ODA) based on aromatic diamines was synthesized. The precursor of polyimide was characterized using Fourier Transform Infrared Spectroscopy (FTIR). Nanofibers were successfully drawn from PMDA –ODA poly (amic acid) containing different weight percentages Single Walled Carbon nanotubes (SWCNT) ranging from 0.5 -3wt% using a powerful and novel technique known as electrospinning. The thermal decomposition temperature of these composite nanofibres was found to increase on the addition of SWCNTs. The presence of SWCNT in the composite nanofibres was characterized using Raman spectroscopy. The surface of the composite PMDA–ODA polyimide nanofibres revealed uniform cross section, lengthier and reduction in the diameter of upto 38 % compared to PMDA–ODA poly (amic acid) nanocomposite fibres. The electrical conductivity was $1.783 * 10^3$ S/m for PMDA –ODA polyimide with 3 weight % of SWCNT, which is greater than the semiconductor range. Thus a polyimide composite nanofibre with high thermal stability and improved electrical conductivity was developed using a novel techgnique . Considering its remarkable properties these can be used as nano electrodes in Fuel cells, baterries and other energy storage devices .