J Material Sci Eng 2012, 1:3
http://dx.doi.org/10.4172/2169-0022.S1.008

OMICS Group Conferences
Accelerating Scientific Discovery

International Conference and Expo on
Materials Science & Engineering

October 22-24, 2012 DoubleTree by Hilton Chicago-North Shore, USA

Effect of Ag ion irradiation on the performance of single-walled carbon nanotubes thin film modified Indium tin oxide sensor

Rajendra N.Goyal
Indian Institute of Technology Roorkee, India

Ion beam irradiation of solid materials has been a promising field of research during last decade and it has been well reported that mechanical properties, especially the stability of carbon system have been found to be modified in controlled manner under ion beam treatment of carbon system. The present studies report impact of swift Ag ion irradiation on the performance of single-walled carbon nano tubes coated indium tin oxide sensor for the voltammetric determination of epinephrine. The thin film of single wall carbon naotube deposited on Indium tin oxide was irradiated with Ag ions having energy of 120 MeV with fluences of $1x10^{12}$, $3x10^{12}$ and $1x10^{13}$ ions/cm^2, using palleteron accelerator. The structural differentiations in un-irradiated (pristine) and irradiated thin films were characterized by the Raman spectroscopic analysis. The performance of pristine and irradiated samples was monitored by recording electrochemical measurements for 1 mM epinephrine. The square wave voltammetry showed that epinephrine gets oxidized at peak potential of ~215 mV at 120 MeV Ag ions irradiated electrode, whereas, a small oxidation peak is observed at pristine with peak potential of 320 mV. High peak current at low fluence indicates the ordering of carbon nano tubes, which is destroyed at high fluence. A substantial decrease in the peak potential (105 mV) of epinephrine oxidation reaction clearly indicates that Ag ion irradiated films catalyzes the oxidation in comparison to pristine. Peak current was found ~10 fold larger for irradiated sample than corresponding pristine sample.

Biography

R.N.Goyal did his Ph.D. in 1975 from University of Roorkee, India. He was Postdoctoral fellow in the University of Oklahoma, USA for 5 years and was visiting professor at Kyoto University, Japn. He is working in the area of nano material modified sensors for the determination of steroids and other drugs in biological fluids. He has published more than 250 research papers in the journals of international repute and 38 students have been awarded Ph.D under his guidance. Presently he is visiting professor in Pusan National University, South Korea.

rngcyfcy@gmail.com

Effect of intercritical heat treatment paths on the microstructures of plain carbon dual-phase steels

S. K. Nath
I. I. T., India

Dual-phase (DP) steels, whose microstructures consist of ferrite and martensite, have been developed from plain low carbon sheet steel with four different heat treatment paths. These four different cycles are (i) heating as-received steel to the temperature of intercritical region of Fe-C phase diagram for different lengths of time followed be water quenching, (ii) here as-received steel is first heated to austenite region and then its temperature is lowered to intercritical temperature and holding for different lengths of time followed by water quenching (iii) as-received steel is first normalized and then cycle (i) is repeated and (iv) here normalized as-received steel is given heat treatment cycle (ii). The purpose of adopting these four different heat treatment paths is to vary martensite volume fraction and morphology in matrix of ferrite of DP steels as these parameters strongly influence strength and ductility. In the present paper effect of these four heat treatment paths have been examined on the resulting microstructures of DP steels.

indiafmt@iitr.ernet.in