

## ABSTRACT

A simple and inexpensive chemical vapor deposition technique is established for the synthesis of carbon nanotubes. Carbon nanotubes were synthesized for the first time on steel substrate without using catalyst material. Natural gas was used as precursor. Deposited nanostructures were observed by optical microscope and were analyzed and characterized by scanning electron microscope and atomic force microscope. Fractal analysis of the deposited material was also performed and fractal dimension was calculated by modified box counting method. This new concept was used for the first time for in – depth study of fractal nature of the deposited carbon nanotube surface. Results showed that MW-CNTs of mean diameter of 2.349nm were synthesized by a relatively modest method. Calculated fractal dimension,  $D \approx 1.78$  with  $R^2 = 0.9992$ , indicated surface fractality of the carbon nanotubes and fractal – like growth pattern.