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Growth of Single Wall Carbon Nanotubes from Iron Oxide Catalyst RAMA BALASUBRAMANIAN[1], Georgetown University, PAOLA BARBARA, Georgetown University — Carbon nanotubes are cylindrical nanostructures with hexagonal networks of carbon atoms with interesting electronic and mechanical properties. CNT synthesis route involving the catalytic decomposition of hydrocarbons on metal particles have been widely popular. We have shown that single wall carbon nanotubes of diameters less than 2 nanometers can be grown directly from catalyst particles comprising of maghemite (γ-Fe_2O_3) on a Silicon substrate using the conventional CVD process. The sizes of SWNT were measured using Atomic Force Microscopy. The average tube diameter was measured to be 1.0±0.2 nm. FTIR and X-ray diffraction measurements were performed to characterize the catalyst iron oxide. Scanning Electron Microscopy measurements revealed that the catalyst oxide particles formed in clusters of 100 nm diameters. Transmission Mössbauer measurements at room temperature showed the presence of only a superparamagnetic doublet, characteristic of nanophase iron oxides. The crystallographic, morphological and magnetic properties of the catalyst metal powders and the properties of the resulting SWNTs will be presented. .

[1]Membership Pending

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