

SYNTHESIS OF VERTICAL GROWN BAMBOO TYPE CARBON NANO TUBES

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ABSTRACT

Bamboo type nanotubes were synthesized by acetylene gas in a hydrogen plasma environment using Microwave Plasma Enhanced Chemical Vapor Deposition (MPECVD) equipment with C_2H_2/H_2 as source gases. The Bamboo type nanotubes was arranged vertically with the TiN barrier layers and the Ni catalyst were used in an experiment on the growth of carbon nanotubes (CNTs) on Si wafer. The specified temperature annealing has done on the H_2 environment to enhance the particle formation. The metal particle size is closely related to the diameter of the nanotubes, when carbon nanotubes are synthesized on transition metal-coated substrates by the thermal Chemical Vapor Deposition (CVD) method. In order to investigate the optimal conditions for growth of Bamboo type CNTs, the nickel (Ni) thin films were annealed at various temperatures under hydrogen atmosphere. The growth rate of carbon nanotubes was most remarkable after annealing at 700 °C.

Keywords: Carbon nanotubes, MPECVD, Ni thin films, reaction time.