

Thiti Thitapura 2007: Growth of Carbon Nanotubes by Thermal Chemical Vapor Deposition on Thin Nickel Film. Master of Science (Physics), Major Field: Physics, Department of Physics. Thesis Advisor: Assistant Professor Surasak Chiangga, Dr.rer.nat. 80 pages.

The effect of flow rate of acetylene gas to synthesise carbon nanotubes (CNTs) was studied. Thin nickel film was coated on quartz substrate at a thickness of 20 nm. The CNTs were synthesized on the thin nickel film by the Atmospheric Pressure Thermal Chemical Vapor Deposition method at 750 °C for 30 minute under hydrogen gas. A stainless steel tube, with a diameter of 0.05 m and length of 1.5 m was use as a chamber.

With flow rates of acetylene of 30, 90, 120 and 150 sccm, scanning electron microscope investigations revealed that the outer diameter of the CNTs were 230, 280, 250 and 230 nm, the number of CNTs per μm^2 were 0.75, 1, 1.5 and 2.5 and the distance between CNTs were 2350, 920, 480 and 300 nm respectively. The experimental data indicate that flow rate of acetylene was proportional to the density of CNTs and inversely proportional to distance between CNTs

The crystallinity of CNTs was proportional to the outer diameter of the CNTs. The FT-Raman spectrum revealed that the hybridization of synthesized CNTs was sp^3 more than sp^2 which infers defect in the CNTs structure

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