Synthesis of Carbon Nanotube by Thermal CVD

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ABSTRACT

Nano-Sized nickel particles were deposited on silicon substrates by sol-gel process as the catalysts for the growth of carbon nanotubes using atmospheric thermal CVD process. The results show that several parameters which incluning during the synthesis has prominent effect on the diameter and morphology of the carbon nanotube.The pretreatment mode, ambient gases, its flow rate and synthesis temp. A pretreatment temperature of 800°C ~ 900°C is adequate for CNT growth.Ammonia is a better pretreatment gas than hydrogen in reduning the content of amorphous carbonaceous by produce. The optimal temperature range for CNT growth lies between 700°C to 900°C.Addition of hydrogen, had better effect on nanotube quality than those without H2 addition. Under proper ratio of H2/C2H2,CNT grows at considerable rate. It took about 10~20 minutes for complete CNT growth under H2 containing ambient. For better control of the orientation of as grown CNTs. more detail information about the effect of NH3 H2 and C2H2 would be necessary.

Keywords : catalyst, chemical vapor deposition,carbon nanotubes

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