

SYNTHESIS OF CARBON NANOTUBES USING CATALYTIC CHEMICAL VAPOR DEPOSITION

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Chemical Vapor Deposition (CVD) synthesis of Carbon Nanotubes (CNTs) was carried out in a self-assembled apparatus consisting of a hot tube furnace. Magnesium Oxide supported Iron catalyst samples, containing varied proportions of Iron loadings were prepared using impregnation methodand spread uniformly over Copper strips. Ceramic boats were placed in the furnace so as to expose the catalyst-loaded Copper strips to industrial gases such as Nitrogen, Methane and Hydrogen. Usage of horizontal tube furnace instead of conventional CVD reactor not only reduced the cost but also added to the simplicity of the apparatus. Additionally, ceramic boats are at least 50% cheaper than the commonly used quartz boats. FESEM tests on the resultant samples revealed that the CNTs ranged between 19.78 nm and 30.36 nm in diameter, which validates the nanotube structures. We demonstrate that increasing the iron loading in the catalyst samples enhanced the probability of CNT formation: 0% iron loading yielded no CNTs, while increasing the loading to 6.5% gave way to formation of Multi-walled Carbon Nanotubes (MWCNTs). This study opens up an economical route for the mass production of MWCNTs.

Biography

Shatakshi is pursuing her Bachelors at the age of 20 years from Indian Institute of Technology (IIT) Roorkee. She developed Python program for implementing ray tracing algorithm for line - of - sight imaging of the rocket combustion chamber (BKH) cross section as a part of post-processing the results at DLR Lampoldshausen, Germany.

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