Characterization of carbon nanotubes synthesized from hydrocarbon-rich flame

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Abstrak

The present study focuses on the characterization of carbon nanotubes (CNTs) synthesized from flame under an atmospheric condition. A laminar flame burner was utilized to establish a rich premixed propane/air flame at the equivalence ratio ? = 1.8–2.2. The flame was impinged on a stainless steel wire mesh coated with nickel (Ni) catalyst to grow CNTs. Distribution and yield of the CNTs on the substrate were quantified. Carbon nanotubes formed on the substrate were harvested and characterized using scanning electron microscopy (SEM), field emission scanning electron microscopy (FESEM), energy dispersive X-ray spectroscopy (EDX), and thermogravimetric analysis (TGA). The FESEM micrograph showed that the CNTs produced were in disarray. The synthesized CNTs were an average of 50–60 nm in diameter while the length of the tubes was in the order of microns. TGA analysis showed that 75% of CNTs were present in the sample and the oxidation temperature was 510°C.