

Carbon nanostructures grown from waste latex via chemical vapor deposition

ABSTRACT

In this work, CNS were successfully synthesized using waste latex from natural rubber gloves as carbon source via chemical vapor deposition. The synthesized process has been done at reaction temperature of 700°C using iron oxide as catalyst. The CNS characterization were investigated by atomic force microscopy (AFM), field emission scanning electron microscopy (FESEM), transmission electron microscopy (TEM), Energy-dispersive X-ray spectroscopy (EDS) and Raman spectrum techniques. It was found that the obtained carbon material existed in the form of nanotubes, fibers and nanocapsules with diameter of 5 - 20 nm. The IG/ID value was found to be approximately 0.84, indicating CNS in the samples were not well crystalline and contain defects. HRTEM images and EDS results reveal non-uniform of large catalyst size and impurities of carbon source might lead to less population of grown CNTs. This study demonstrates that waste latex can be an alternative and inexpensive carbon source for CNS production and promotes green technology.

Keyword: Carbon nanostructures; Waste latex; Natural rubber