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Properties of Nitrogen-doped Multi-walled Carbon Nanotubes Synthesized by PECVD

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We have investigated nitrogen-doped multi-walled carbon nanotubes(MCNTs) synthesized grown by dc plasma-enhanced chemical vapor deposition. A mixture of NH3 and C2H2 gases with the ratio of 4:1 was used as a precursor for the synthesis of MCNTs on the Ni/TiN/Si(100) substrates. For the doping of MCNTs N2 gas was introduced at the flow rate of 60 sccm. The structure and composition of the doped MCNTs were investigated by scanning electron microscopy, transmission electron microscopy, x-ray photoemission spectroscopy, Raman spectroscopy, and field emission properties. The MCNTs synthesized with N2 were 2-5 times longer than those synthesized without N2 , and the morphology of the MCNTs were improved.