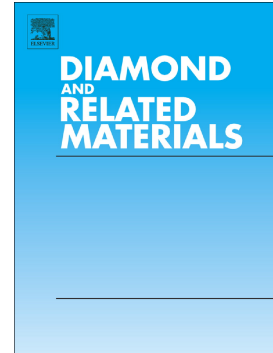


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Ultrafast carbon nanotube growth by microwave irradiation

Mimi Zhan,^{a,b} Ganghua Pan,^{*a,b} Yaping Wang,^{a,b} Tong Kuang^{a,b} and Feifei Zhou^{a,b}

^aSchool of Materials Science and Engineering, Southeast University, Nanjing 211189, P. R. China

^bJiangsu Key Lab of Construction Material, Southeast University, Nanjing211189, P. R. China

Abstract: Carbon nanotubes (CNTs) have been rapidly synthesized in 20–40 seconds through a one-step microwave heating method. Copper wire, molybdenum wire, iron wire and steel fiber were respectively mixed with ferrocene to achieve the fast growth of CNTs at room temperature in air with the aid of a domestic microwave oven. Copper wire, molybdenum wire, iron wire and steel fiber were applied to initiate the pyrolysis of ferrocene for inducing CNT growth. Scanning electron microscopy (SEM) results show that CNTs with varied morphologies and features were obtained when varied metal materials were used. High-resolution transmission electron microscopy (HRTEM) images show well-developed graphitic sheets of the as-grown CNTs, and thermogravimetric results revealed the CNT's high purity. This study provides a facile and ultrafast method for CNTs growth in ambient conditions without any inert gas protection.

Keywords: carbon nanotubes; growth; microwave; metal materials; ferrocene; nanotechnology

* Corresponding author. Tel: +86-13357827675, E-mail: 101004929@seu.edu.cn

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