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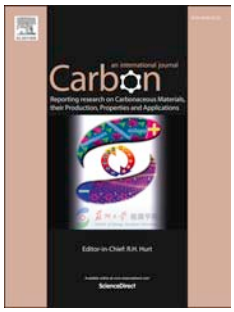

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Potassium intercalated multiwalled carbon nanotubes

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Abstract

Full intralayer potassium intercalation in multiwalled carbon nanotubes was achieved by carefully engineering the nanotube morphology (length, width, and number of layers). The complete intercalation induced a high doping resulting in metallic nanotubes with a bright golden color. The successful intercalation of MWNTs serves as a first step for obtaining controlled graphene nano-ribbons through exfoliation and potentially preparing superconducting nanotubes.

Keywords: `Multiwalled carbon nanotubes, Intercalation, Raman, XRD, SEM, Electron-phonon coupling`

1. Introduction

The chemical combination of alkali-metals (*e.g.* K, Ca, and Li) with graphite gave rise to graphite intercalation compounds (GICs) in 1981. [1] The highly doped (electron concentration $n \geq 1 \times 10^{14} cm^{-2}$) graphitic compounds have outstand-

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