Diameter-Selective Removal of SWNTs by Light-Assisted Oxidation

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We have reported that light irradiation can enhance the oxidation of single-wall carbon nanotubes (SWNTs) with hydrogen peroxide. Our experiment results showed that when the SWNTs were treated with hydrogen peroxide and irradiated by light of 488-nm or 514-nm wavelength, those with diameters of about 1.2 and 1.33 nm could be selectively removed [1]. In this report, several different wavelengths of light were used to further study the effect of light on oxidation of SWNTs. UV-vis-NIR absorption spectra, fluorescence spectra and Raman spectra have confirmed that SWNTs of certain diameter could be selectively removed by carefully selecting a light wavelength corresponding to the gap energy of the SWNTs. This discovery should contribute to the separation or extraction of SWNTs with certain structure.

(1) M.Yudasaka, M.Zhang, S.Iijima, Chem. Phys. Lett. 374(2003)132.