

## I&EC 129

# Light-assisted oxidation for diameter-selective removal of SWNTs

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In the purification of single-wall carbon nanotubes (SWNTs), oxidation has often been used to remove amorphous carbon (a-C). In such a process, SWNTs with small diameters are often combusted together with the a-C. Under an extreme oxidation-condition where we used nitric acid, we found an unexpected reaction occurred and large-diameter tubes were newly generated. To control the oxidation process, we propose the application of light under the weak oxidation condition. We have shown in a previous report that SWNTs of certain diameters can be selectively and preferentially eliminated through oxidation in H<sub>2</sub>O<sub>2</sub> when irradiated by light with a wavelength corresponding to the gap energy of the SWNT (1). This effect of light has been further studied by measuring the optical absorption and emission spectra. The action of H<sub>2</sub>O<sub>2</sub> and the mechanism of diameter-selective elimination will be discussed in the presentation. (1)M.Yudasaka, M.Zhang, M.Iijima, Chem. Phys. Lett. 374(2003)132.

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