

Labeling Carbon Nanotubes with Fluorescent Probes

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Single-wall and multiple-wall carbon nanotubes were functionalized with a dendron that contains the fluorescent probe pyrene. These functionalized nanotubes are soluble in common organic solvents, forming highly colored solutions. Fluorescence properties of the pyrene moieties hanging on the nanotubes were studied systematically using both steady-state and time-resolved methods. The results show strong excimer emission even for the sample solution of an extremely low concentration, which is indicative of the excimer being intramolecular. The excimer emission becomes negligible for the samples in a highly viscous polymer blend or in a solution at low temperature of 77 K. Mechanistic implications of the spectroscopic results will be discussed.