

Abstract Submitted
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Trench width dependence of photoluminescence intensity from individual suspended carbon nanotubes¹ S. MORITSUBO, T. MURAI, T. SHIMADA, Y. MURAKAMI², S. CHIASHI, S. MARUYAMA, Y. K. KATO³, University of Tokyo — As-grown, air-suspended carbon nanotubes (CNTs) offer the possibility to optically investigate the intrinsic properties of CNTs. We prepared trenches of various widths on SiO₂/Si substrates and suspended CNTs grown by chemical vapor deposition. Individual suspended CNTs were identified by taking photoluminescence (PL) images using a home-built laser-scanning confocal microscope system. PL excitation spectra were used to determine the chirality, and the orientation was measured by polarization spectroscopy. After such characterization, trench width dependence of the PL intensity was investigated. We observed that PL diminished as the trench width decreased, and extrapolation of the data yields quenching of PL at nonzero trench widths. By analyzing the data, it may be possible to obtain the diffusion length of excitons in pristine CNTs.

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