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Second-Harmonic Generation of Aligned Single-Walled 0.4nm Carbon Nanotubes KAM SING WONG, HUIMIN SU, JIANTING YE, ZIKANG TANG, The Hong Kong University of Science and Technology — The second-harmonic generation (SHG) is measured for the first time from monosized and well-aligned single-walled carbon nanotubes (SWCNT) in the channel of aluminophosphate AlPO4-5 (AFI) zeolite. The SHG yield scales as quadratic function of the pump laser intensity. Due to the different polarization preference, we are able to discriminate the SHG contribution from the chiral (4,2) CNTs and those from the AFI template. The polarization direction and the anisotropic dependence of the SHG intensity on the excitation polarizations are investigated in the transmission geometry. In the case of normal incidence, the intensity of SHG is maximized when the excitation polarization is 45 degree against the tube axis and the SH radiation is linear-polarized on the plane perpendicular to the tube axis. The experiment results are in excellent agreement with the theoretical prediction of the second-order nonlinear optical process in chiral carbon nanotubes.

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