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Control of structures of Carbon Nanowalls in plasma enhanced CVD WAKANA TAKEUCHI, Nagoya Univ., YUTAKA TOKUDA, Aichi Inst. Tech., MINEO HIRAMATSU, Meijo Univ., HIROYUKI KANO, NU-Eco Eng, MASARU HORI, Nagoya Univ. — Carbon nanowalls (CNWs), two-dimensional carbon nanostructures consisting of graphite sheets standing vertically on the substrate, have attracted much attention for several applications. In view of the practical application of CNWs, it is necessary to control their structure and electronic properties. In this study, we focused on the control of CNW structures. CNWs were fabricated on the Si substrate by the fluorocarbon plasma-enhanced CVD with H radical injection. We investigated the influence of O₂ addition to the mixture of C₂F₆/H₂ on the morphology and structure of CNWs. Raman spectroscopy was used to evaluate the structure of CNWs. The morphology and crystallinity of CNWs were found to be controlled by the O₂ addition. Raman spectra for all samples have a strong peak at 1590 cm⁻¹ (G-band) indicating the formation of a graphitized structure and another peak at 1350 cm⁻¹ (D-band) corresponding to the disorder-induced phonon mode. As a result of O₂ addition, width and peak intensity ratio of D/G bands of CNWs decreased. Oxygen atom would play a role of etching of disorder carbon phase and contribute to the higher graphitization.

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