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**Morphological control of carbon nanowalls by reactive ion etching** MASARU HORI, HIROKI KONDO, SHINGO KONDO, YUDAI MIYAWAKI, HAJIME SASAKI, Nagoya University, MINEO HIRAMATSU, Meijo University, NAGOYA UNIVERSITY TEAM, MEIJO UNIVERSITY COLLABORATION — Carbon nanowalls (CNWs), two-dimensionally-standing graphene sheets, were one of carbon nanomaterials expected to realize novel functional devices, such as electron emission devices, electrode of fuel cell, gas filter, and so forth. In order to apply CNWs to those devices, modification techniques of their shapes and morphologies are required. In this study, we have demonstrated the reactive ion etching (RIE) of CNWs. By the RIE employing H<sub>2</sub>/N<sub>2</sub> gases, the CNWs were anisotropically-etched at a relatively high rate of an approximately 250 nm/min. On the other hand, the 10 nm-thick interface layers between CNWs and Si substrates still remained and were not completely etched. The RIE employing Ar/H<sub>2</sub> gases enabled us to remove completely the interface layer. The Ar/H<sub>2</sub> RIE was also carried out on the bottom surface of CNWs after they were exfoliated from the Si substrates. As a result, the free-standing CNW film of 550 nm in thickness without an interface layer for membrane filters was successfully formed.

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