

Abstract Submitted
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On the Structure Control of Vertical Nanographene Network MI-NEO HIRAMATSU, HITOSHI NOZAKI, TAKUYA SUZUKI, KEIGO TAKEDA, Meijo University, HIROKI KONDO, MASARU HORI, Nagoya University — Carbon nanowalls (CNWs) are few-layer graphenes, standing vertically on a substrate to form a self-supported network of wall structures. The maze-like architecture of CNWs would be useful as a platform for electrochemical and bio-sensing, and energy conversion, due to the large surface area of conductive carbon and the wide capability of surface modification including decoration with metal nanoparticles. CNWs can be fabricated using PCVD. The balance between carbon precursors and etching radicals would affect the morphology, crystallinity and growth rate of CNWs. For example, H content in the plasma increased, crystallinity improved and interspaces between adjacent nanowalls increased, while the growth rate of CNWs decreased. From a practical point of view, control of CNW structures including spacing between adjacent nanowalls and crystallinity is significantly important, and their nucleation control should be crucial, since the basic structure would be determined by the nucleation. We carried out CNW growth using PCVD employing CH₄/H₂/Ar mixture with emphasis on the structure control of CNWs. In this work, we report the effects of ion bombardment and catalytic metals on the nucleation of vertical nanographenes to realize active control of interspace between adjacent walls.

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