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Initial Formation of Carbon Nanowalls Synthesized by Ar Ions and CF_X/H Radicals SHINGO KONDO, OLIVERA STEPANOVIC, MAKOTO SEKINE, MASARU HORI, Nagoya University, KOJI YAMAKAWA, SHOJI DEN, Katagiri Engineering Co., Ltd., MINEO HIRAMATSU, Meijo University — Carbon nanowalls (CNWs) consist of graphene sheets standing vertically on the substrate. Due to their unique structures, they have attracted much attentions for various applications. In order to clarify the growth mechanism, in-situ observation of the initial growth stage of CNWs is extremely important. In this study, the new apparatus of CF_X and H radical sources with C_2F_6 and H_2 gases and an Ar ion source was constructed, and in-situ observation on the substrate surface was performed employing a spectroscopic ellipsometer. When a gas flow ratio of H_2 to C_2F_6 was 1:2 with Ar ions accelerated at 200 V at 2.5 Pa, CNWs started to grow in 7 min. The refractive index and the extinction coefficient of the material were approximately 1.3 and 0.2, respectively, and it included voids of more than 80 %. Hence, it was estimated that CNWs had with metallic graphite, which was also confirmed by Raman spectroscopy and SEM. On the basis of these results, the growth mechanism of CNWs is discussed.

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