Growth Properties of Carbon Nanowall According to the Substrate Angle

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Abstract: The carbon nanowall (CNW) is a carbon-based nanomaterials and it was constructed with vertical structure graphenes and it has the highest surface density among carbon-based nanostructures. In this study, we have checked the growth properties of CNW according to the substrate angle. Microwave plasma enhanced chemical vapor deposition (PECVD) system was used to grow CNW on Si substrate with methane (CH4) and hydrogen (H2) gases. And, we have changed the substrate angle from 0° to 90° in steps of 30°. The planar and vertical conditions of the grown CNWs according to the substrate angle were characterized by a field emission scanning electron microscopy (FE-SEM) and energy dispersive spectroscopy (EDS). In case of the growth angle increases, our experimental results showed that the length of the CNW was shortened and the content of carbon component was decreased.

Keywords: Carbon nanowall, Plasma-enhanced chemical vapor deposition, Substrate angle

1. 서론