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Rapid thermal annealing effect on characterizations of CNW by chemical vapor deposition

In this study, CNW(Carbon Nanowall) is grown on a silicon substrate by using microwave PECVD(Plasma enhanced chemical vapor deposition), and structural heat treatment of CNW using RTA(Rapid Thermal Annealing) The results of analyzing the characteristics and the electrical characteristics are shown. Using microwave PECVD, CNW was grown for 15 minutes on a silicon substrate at 1300W and 600°C. Then, the grown CNW was subjected to a heat treatment according to temperatures of 600°C, 700°C, 800°C and 900°C. using RTA. We analyzed the structural characteristics and electrical characteristics of CNW fabricated and CNW not heat treated. In order to analyze structural characteristics, we used EDS(Energy dispersive X-ray spectroscopy) and Raman spectroscopy attached to FE-SEM(Field Emission Scanning Electron Microscope), SPM(Scanning Probe Microscopy), and FE-SEM. The cross section of CNW was analyzed by cross-section FE-SEM. The surface of CNW was analyzed with SPM and surface FE-SEM. Utilizing Raman spectroscopy, after confirming the growth of CNW, the crystal of CNW was confirmed by ID/IG ratio. Using the EDS, the element weight% and atomic% of CNW were measured, respectively. A Keithley 2400 instrument was used to analyze the electrical properties. Current and voltage of CNW were measured and resistance was calculated. CNW grown on a silicon substrate was compared with the structural characteristics and electrical characteristics of the heat treated using RTA unless heat treatment was performed.

Primary author(s) : JANG, Soojung; Mr YOO, Seung-cheol; Ms JUNG, Sejin; Mr LEE, Taehwan; Prof. KANG, Hyunil

Presenter(s) : JANG, Soojung

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