NT-P001

# **제46회** 한국진공학회 동계학술대회

# Analysis of Au-DNA Nanowires by Adding HCl to Change Charges of Au Nanoparticles

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Top-down processes based on photolithography technology have been developed by using light sources with short wavelength, however, the processes are expected to meet their limits in higher integration of semiconductor integrated circuits. To overcome the limits, researches on bottom-up processes have been proceeded. One of those, fabrication of nanodevices by using nanoparticles has been on research. But it is difficult to align nanoparticles at appropriate positions. To resolve this, studies has been proceeded to form nanowires by bonding DNA molecules which have self-assembly property and positive-charged functionalized gold nanoparticles. There are negative-charged phosphates in backbones of DNA molecules. By using the attractive force between the negative charge of the phosphates and the positive charge of gold nanoparticles, the Au-DNA nanowires are made. However, bonding Au nanoparticles only on DNA molecules, not other nanoparticles, is to be solved. So we studied to resolve this problem. In the formation of Au nanoparticles, we changed the charge of Au nanoparticles by adding HCl to control pH of the functionalized nanoparticles, measured zeta potential. Then we bonded the nanoparticles and DNA molecules and made observation by using FE-SEM and AFM.

Keywords: Gold Nanoparticles, HCl, DNA, nanowire

### NT-P002

## Graphite상의 ZnO Nanorod성장과 그를 이용한 Schottky Diode 제작 남광회<sup>1</sup>, 백성호<sup>2</sup>, 박일규<sup>1</sup>

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We report on the growth of ZnO nanorods (NRs) grown on graphite and silicon substrates via an all-solution process and characteristics of their heterojunctions. Structural investigations indicated that morphological and crystalline properties were not significantly different for the ZnO NRs on both substrates. However, optical properties from photoluminescence spectra showed that the ZnO NRs on graphite substrate contained more point defects than that on Si substrate. The ZnO NRs on both substrates showed typical rectification properties exhibiting successful diode formation. The heterojunction between the ZnO NRs and the graphite substrate showed a Schottky diode characteristic and photoresponse under ultraviolet illumination at a small reverse bias of -0.1 V. The results showed that the graphite substrate could be a good candidate for a Schottky contact electrode as well as a conducting substrate for electronic and optoelectronic applications of ZnO NRs.

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Keywords: ZnO, nanorod, hydrothermal, graphite, Schottky diode