NT-P001

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

정윤호, 김대철, 박현규, 노용한

성균관대학교 정보통신대학

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

남광희[1], 백성호[2], 박일규[1]

[1]영남대학교 전자공학과, [2]대구경북과학기술원 에너지연구부

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.

Acknowledgements

This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2012R1A1 A1001711).

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