NT-P016

Control of Nanospacing in TiO_2 Nanowire Array Using Electron Beam Lithography

Young-Shik Yun[1,2], Jong-Souk Yeo[1,2,*]

[1]School of Integrated Technology, Yonsei University, Incheon 406-840,
[2]Yonsei Institute of Convergence Technology, Yonsei University, Incheon 406-840, Korea

According to advanced nanotechnology in the field of biomedical engineering, many studies of the interaction between topography of surfaces and cellular responses have been focused on nanostructure. In order to investigate this interaction, it is essential to make well-controlled nanostructures. Electron beam lithography (EBL) have been considered the most typical processes to fabricate and control nano-scale patterns. In this work, TiO_2 nanowire array was fabricated with hybrid process (top-down and bottom-up processes). Nanodot arrays were patterned on the substrate by EBL process (top-down). In order to control the spacing between nanodots, we optimized the EBL process using Poly(methyl methacrylate) (PMMA) as an electron beam resist. Metal lift-off was used to transfer the spacing-controlled nanodots as a seed pattern of TiO_2 nanowire array. Au or Sn nanodots which play an important role for catalyst using Vapor-Liquid-Solid (VLS) method were patterned on the substrate through the lift-off process. Then, the sample was placed in the tube furnace and heated at the synthesis temperature. After heat treatment, TiO_2 nanowire array was fabricated from the nanodots through VLS method (bottom-up). These results of spacing-controlled nanowire arrays will be used to study the interaction between nanostructures and cellular responses in our next steps.

Acknowledgements
This research was supported by the MSIP(Ministry of Science, ICT and Future Planning), Korea, under the "IT Consilience Creative Program" (NIPA-2013-H0203-13-1002) supervised by the NIPA(National IT Industry Promotion Agency)

Keywords: nanowire array, eletron beam lithography, vapor-liquid-solid

NT-P017

Nano Patterning Functional Polymers Using Nano-imprint Technique

권현근, 이규태

한국과학기술연구원(KIST)

Previous studies to enhance optical properties of opto-electronic devices involve patterning of inorganic materials. Patterning of inorganic material usually encompasses vacuum process that hinders productivity and increases cost. In this research, we successfully formed nano patterns with polymer matrix and fabricated photonic crystals. This process is anticipated to increase the performance of opto-electronic devices without any vacuum process. Moreover, nano imprint technology reduces cost and bolsters productivity.

This work was supported by KIST Flagship Project, project number 2E23892.

Keywords: Polymer Patterning, NOA, Polysilazane, Optics, photonic crystal