

TiO₂ nanorods grown on Ta substrates using a single molecular precursor by thermal MOCVD

Kang Suk Lee, Jae-Sung Hyun, Young Dok Kim, and Jin-Hyo Boo

Department of Chemistry, Sungkyunkwan University, Suwon, 440-746, Korea

Using Titanium Tetra isopropoxide (TTIP) as a single precursor without any carriers or bubbling gases, TiO₂ nanorods could be successfully grown on Ta substrates. For the characterization of the TiO₂ structures, scanning electron microscopy (SEM), x-ray diffraction (XRD) and x-ray photoelectron spectroscopy (XPS) were employed. For substrate temperatures below 800°C, a rough film structure without nanorod could be found. At a sample temperature of 800°C, in contrast, nanorod structures with a diameter and a length of about 0.1~0.2 μm and 0.7~1.5 μm , respectively, could be synthesized. The nanorods exhibited a rutile phase with a 1:2 stoichiometry between O and Ti, which was identified using XRD and XPS. When the temperature was higher than 800°C, agglomeration of the nanorods could be identified.