

Selective adsorption of vanadium pentoxide nanowires on the patterned self-assembled monolayers with different terminal groups

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Nanoscale materials are different from bulk materials in electronic and optical properties. Nanowires and nanotubes have attracted versatile interests due to their high potential to be used in future nanoscale devices. Among those, vanadium pentoxide (V_2O_5) nanowires have been expected due to the ease of size-control and synthesis. Selectivity of V_2O_5 nanowires, which were made by sol-gel method, was studied by adsorption on the patterned substrates prepared by self-assembled monolayers (SAMs) with different terminal groups. The functionalized Au or SiO_2/Si substrates were formed with thiol or silane molecules having amine ($-NH_2$) and methyl ($-CH_3$) terminal groups by micro-contact printing (μ CP). In accordance with the variety of size and shape of patterns, the behavior of adsorption and alignment of nanowires were investigated by Atomic force microscopy (AFM). Selective adsorption of nanowires is affected by the electrostatic force between nanowires and substrates.