

Patterning of vanadium pentoxide (V_2O_5) nanowires by μ -contact printing technique via selective etching process

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One-dimensional nanowires have attracted scientific as well as technological interest owing to their noble structures and the potential as future nanoscale devices. With the ease of size control and synthesis, vanadium pentoxide (V_2O_5) nanowires can be used as important nano-functional materials. Here, we developed a simple process for the large-scale patterning of nanowires on functionalized SiO_2 substrates. The thin films of V_2O_5 nanowires on amine ($-NH_2$) terminated self-assembled monolayer was patterned by μ -contact printing where the PDMS stamp was inked by HCl. The V_2O_5 nanowires were selectively etched by HCl and the produced pattern was characterized by atomic force microscope (AFM). With variation of the hydrophilicity of the PDMS stamp, the patterning mechanism was also investigated.