

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Self-Assembly for Large Scale Fabrication of Integrated Electronic Devices Based on 1-D Nanostructures.¹ JUNTAE KOH, MINBAEK LEE, JIWOON IM, SUNG MYUNG, SEUNGHUN HONG, School of Physics, Seoul National University, Seoul, Korea — Recently, electronic devices based on 1-dimensional (1-D) nanostructures (e.g. carbon nanotubes (CNTs) and nanowires) have been drawing much attention as next-generation device architecture. However, the shortage of reliable nanomanufacturing methods for such circuits has hindered their practical applications. One promising nanomanufacturing method can be ‘surface-programmed assembly’ process, where functional molecular monolayer on the substrate guides the ‘selective assembly’ and ‘alignment’ of nanowires and nanotubes on the substrate without relying on any external forces. Using this method, we successfully assembled and aligned carbon nanotubes and vanadium oxide nanowires on various substrates including Au, silicon oxide, Si, Al, and polymer. Furthermore, by additional microfabrication process, we demonstrated large-scale fabrication of various device structures such as junctions and top-gate transistors based on CNTs and vanadium oxide nanowires. Significantly, since this process does not require any high-temperature processing steps, it can be applied to virtually general substrates and may remove current difficulty in manufacturing of electronic devices based on 1-D nanostructures.

¹This work was supported by NSI-NCRC and SAIT.

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Date submitted: 29 Nov 2005

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