

A facile fabrication method of suspended SWCNT field effect transistors on plastic substrates

김준성, 하정숙^{1,*}

고려대학교; ¹고려대학교 화공생명공학과

(jeongsha@korea.ac.kr*)

Single walled carbon nanotubes (SWCNTs) have been extensively studied as channel materials for nano-electronic devices due to their superior electronic properties including the excellent carrier mobility. Carrier mobility in the field effect transistor (FET) is influenced sensitively by the gate dielectric materials, which can be alleviated by fabricating the suspended CNT FETs. However, it requires complicated fabrication processes to make suspended nanowire devices. In this paper, we suggest a facile fabrication method of suspended SWCNT FETs on plastic substrates via a transfer printing technique. On the CNT-grown SiO₂ substrate, the topside down FET structures are fabricated by conventional semiconductor processes and then those are transferred onto the elastomeric polymer substrate via controlling the relative interaction between the polymer and the fabricated FET arrays compared to that between the SiO₂ and the device arrays. We will compare the device performance with that of conventional FETs using gate dielectric materials.