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Electronic structure control of carbon nanotubes by using electrophilic molecules HYE-MI SO, Nanomaterials Research Team, Korea Research Institute of Chemical Technology, Daejeon, Korea, BYOUNG-KYE KIM, Chonbuk Nat'l Univ., Jeonju, Korea, DONG-WON PARK, Nanomaterials Research Team, KRICT, Daejeon, Korea, JU-JIN KIM, Chonbuk Nat'l Univ., Jeonju, Korea, KI-JEONG KONG, HYUNJU CHANG, JEONG-O LEE, Nanomaterials Research Team, KRICT, Daejeon, Korea — In the applications of SWCNTs, the uniformity of the electronic properties of individual nanotubes can be crucial, especially in case of electronic devices. Since there is no synthetic method to produce nanotubes with uniform chirality, several techniques such as dielectrophoresis, chemical treatment, or DNA wrapping were reported to separate semiconducting nanotube from metallic ones or vice versa. Here, we present the electrical transport properties of SWCNT-FETs treated with four different electrophilic molecules, bromobenzenediazonium-, nitronium-, benzodithiolylium-, and triphenylpyrylium tetrafluoroborate. All four molecules show similar effect on SWCNT-FETs, about 1/3 of the devices that were originally containing both metallic and semiconducting nanotubes showed complete depletion at positive gate voltages.

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