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Effects of sidewall functionalization on the conducting properties of SWNTs HYOUNGKI PARK, Univ. of North Carolina at Chapel Hill, JIJUN ZHAO, Washington State University, JIANPING LU, Univ. of North Carolina at Chapel Hill — We investigated the conducting properties of sidewall functionalized SWNTs with a finite addend concentration. Robust differences are found between monovalent and divalent addends. For monovalent addition a small number of addends can significant disrupt the ballistic conductance of nanotubes near the Fermi level. As the addend concentration increases the conductance rapidly decreases and approaches zero at addends to C ratio around 25%. In contrast, divalent addends have only weak effects on the conducting properties and the nanotube quantum conductance remains above 1 even for addend concentration as large as 25%. These differences can be attributed to the formation of impurity state near the Fermi level for monovalent addition, while divalent addends create impurity states far away from the Fermi level.

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