An analytical study on electronic transport of typical nanotubes with square structure network

H Rabani\textsuperscript{1,2}, M Mardaani\textsuperscript{1,2} and S Vosooghi\textsuperscript{-}nia\textsuperscript{1}

1. Department of Physics, Faculty of Science, Shahrekord University, P. O. Box 115, Shahrekord, Iran
2. Nanotechnology Research Center, Shahrekord University, Shahrekord 8818634141, Iran
E-mail: rabani-h@sci.sku.ac.ir

(Received 9 May 2012 ; in final form 11 April 2012)

Abstract
In this study, we investigated the electronic conductance of two typical single-wall nanotubes with square lattice by using Green’s function method in tight-binding approximation. Then the effect of various factors such as presence of symmetrical bond defects, the distance between two defects and the nanotube hopping energies was studied on the system electronic conductance. The square and rhombic nanotubes showed metallic and insulator/semiconductor behaviors, respectively.

Keywords: tight binding, Green’s function, transmission, nanotube, square lattice, defect.

For full article, refer to the Persian section