



Iranian Journal of Physics Research, Vol. 12, No. 1, 2012

## The effect of gate voltage on the electrical transport properties in the contacts of $C_{60}$ to carbon nanotube leads

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(Received 5 December 2011 ; in final form 4 March 2012)

### Abstract

In this paper, we examined the effect of gate voltage, bias voltage, contact geometries and the different bond lengths on the electrical transport properties in a nanostructure consisting of  $C_{60}$  molecule attached to two semi-infinite leads made of single wall carbon nanotubes in the coherent regime. Our calculation was based on the Green's function method within nearest-neighbour tight-binding approximation. After the calculation was of transmission, the electrical current was obtained by the Landauer-Buttiker formula. Next, the effect of the mentioned factors was investigated in the nanostructure. The application of the present results may be useful in designing devices based on molecular electronics in nanoscale.

**Keywords:** carbon nanotubes, Fullerene, Green's function, electrical transport

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