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Ballistic Electron Transport in Mixed Graphene-Phagraphene Structure

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Abstract

The process of miniaturization in electronics have made devices each time smaller. This development is going to the direction of atomic properties of old and new materials and the development of new devices based in molecular properties. The aim is to find new applications, phenomena and power economy [1]. Between new structures with highly interesting properties, the two-dimensional allotropic form of carbon, known as graphene, is a promise for the future due to their intrinsic transport properties, high Fermi velocity in low energies, etc. [2,3]. Z. Wang *et al.* have purposed a new allotropic form of carbon, the Phagraphene, that have similarity with graphene, but its structure is different and have lower energies when compared with others allotropic forms. This structure has 5-6-7 carbon rings and distorted Dirac cones [4]. In this study, we have performed electron transport calculations using the NEGF-DFT methodology in the Landauer-Büttiker formalism as implemented in the SIESTA/TRANSIESTA package [5]. Properties as current-voltage and transmission were obtained and shows interesting results in the graphene-phagraphene structure.

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