

"Nanocomposites and nanomaterials"

Features of the generalized dynamics of quasiparticles for nanocrystals of type of graphene

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Crystals with an elementary cell of arbitrary complexity of structure were considered. It was shown that the dynamic model of Dirac for the injected electron is not exclusive only for graphene. It is being implemented in all crystals and practically, for any points of \mathbf{k} -space.

In particular, the general relations obtained in the research, were applied to graphene. Herewith two-dimensional lattice of graphene has been considered as consisting of elementary cells with two atoms. Typically, graphenes is considered as consisting of two simple nested sublattices [1]. It is shown that the total energy of an electron in the conduction band is determined by the known relation: which has the physical meaning of the wave Hamiltonian. All the dynamic characteristics of the injected electron, considered as a quasiparticle, were found: speed, effective dynamic mass, wave Lagrangian, a mechanical momentum, mechanical Hamiltonian and mechanical Lagrangian. A generalized Louis de Broglie relationship between momentums and was found. It is shown that all the dynamic characteristics significantly different from the standard [2, 3].

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