

CHARGE CURRENT THROUGH AND INJECTION  
RADIATION BY CARBON MOLECULES  
CONNECTING ELECTRODES

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S u m m a r y

The dependences of the electron affinity levels on the applied electric field for molecular junctions connecting either metal or semiconductor electrodes have been calculated in the framework of the quantum discrete model (QDM). The molecular junctions were assumed to be formed by molecules, whose structure is composed of a chain of atomic rings: bisthiolterthiophene and monolayer graphene. The dependence of the electron current through the molecular junction on the applied electric field has been calculated. The mechanisms of formation of the steplike character of the current-voltage characteristics (CVCs) in the case of metal electrodes, as well as a well-pronounced nonmonotonic behavior of the CVC in the case of semiconductor electrodes, have been analyzed. The spectral intensity of spontaneous radiation emission, which is generated when the electric current runs through the molecular junction, has been calculated.