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Peierls Structural Transition in Organic Crystals of TTT_2I_3 with Intermediate Carrier Concentration

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The Peierls structural transition in the nanostructured tetrathiotetracene-iodide crystal with intermediate carrier concentration is studied in 2D approximation. In the frame of the physical model, two the most important electron-phonon interactions are considered: of the deformation potential type and of the polaron type. The interaction of carriers with the structural defects is also taken into account. The renormalized phonon spectrum is calculated in the random phase approximation. The method of retarded temperature dependent Green function is applied. It is shown that the transition is of Peierls type and strongly depends on iodine concentration.