Diamagnetism and electron transport in organic layered conductors

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We have studied theoretically the magnetic susceptibility, magnetoresistance and thermoelectric field in organic layered conductors with an arbitrary form of the electron energy spectrum, which are placed in a quantizing magnetic field at low temperature T. At temperatures mach lower than the separation between the electron energy levels of charge carriers $\hbar\omega_c$ quantum oscillations of the magnetization and kinetic coefficients contains the detailed information about energy spectrum and relaxation properties of charge carriers. No less important information may be obtained at $T \gg \hbar\omega_c$. In particular, investigation of the T-dependence of the magnetic susceptibility at different orientations of the magnetic field enables the diamagnetic and paramagnetic contributions to the magnetization to be separated. Studies of the dependence of the magnetoresistence on the magnetic field orientation with respect to the layers makes it possible to determine the contribution to the electron transport from different charge carriers groups. In the magnetic field parallel to the layers the magnetization is mainly originated from the spin-splitting of the electron energy levels. Investigation of the T- dependence of the thermoelectric field allows to study different relaxation mechanisms in electron system.