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Transport through Single-Molecule Transistor: master equation approach

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In the present work we employ the master equation approach to describe the transport through a molecule located in the central region between two external electrodes. In contrast to the transport through a quantum dot electron-phonon coupling should be taken into account when the tunneling through the molecule occurs. The coupling results in appearance of additional effects as vibrational sidebands or, for the case of strong coupling, as suppression of current at a low bias voltage (Franck-Condon blockade). In contrast to the previous studies, the transport properties will be described by the density matrix calculated explicitly with diagonal and off-diagonal elements. The observed phenomena and their comparison with the previous studies will be discussed.