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Probing mechanisms of electrical conduction in single organic molecules LYUDMYLA ADAMSKA, IVAN OLEYNIK, University of South Florida, MORTKO KOZHUSHNER, Institute of Chemical Physics, RAS — The electrical conduction of relatively long (1-2 nm) single organic molecules occurs via resonant tunneling of charge carriers, electrons and/or holes, through the energy levels of negative molecular ion (electrons) and/or positive molecular ion (holes). The position of these resonant energy levels with respect to the Fermi levels of the anode and cathode determines the relative contributions of electron and hole conduction to the resonant current. These resonant levels depend on the applied bias, and are also influenced by several physical factors such as the polarization of the molecule, image potential and metal/molecule interfaces that are difficult to control under conditions of real experiment. In this presentation we suggest a method of *unambiguous experimental* determination of specific type of the conduction mechanism (electron or hole conduction) which is based on the idea of utilizing experimental techniques of nanocalorimetry.

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