TRANSPORT THROUGH SINGLE MOLECULES: POLARIZATION, DYNAMICS AND KONDO

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We use the mechanically controlled break-junction technique to fabricate single-molecule junctions, which are characterized by two-terminal current-voltage characteristics. We have extensively measured the dependence of the transport characteristics from the molecular species. It turns out that polarization effects as a response to the applied bias voltage play an important role. Moreover, at the onset of current, dynamics of the molecular structure can be characterized. This is expressed either as vibronic sidebands of electronic excitations, or more often as a nonlinear process which can be observed in noise measurements. We are further trying to address the magnetic degree of freedom in metal-organic compounds, with the goal of a spin filter built into a single molecule. We will show recent results on mononuclear iron based compounds. They exhibit Kondo behaviour, which appears to be sensitive to mechanical strain.