9.7 cm

Spin-dependent transport through a single molecule: Negative differential resistance effect

Wojciech I. Babiaczyk and Bogdan R. Bułka
Institute of Molecular Physics, Polish Academy of Sciences,
ul. M. Smoluchowskiego 17, 60-179 Poznań, Poland

Theoretical studies of electronic transport were performed on a break junction with a single molecule attached to ferromagnetic electrodes. The Huckel type and the ab -initio method were used to determine the electronic structure of the molecule. The current was calculated within the non-equilibrium Green's function technique. We found a negative differential resistance effect for some molecules, which were strongly coupled with the electrodes. The effect is similar as in the Esaki diode, and one can expect various application of the device. Changing the relative orientation of magnetization in both the electrodes we calculated the magnetoresistance of the system. The magnetoresistance showed a large variation as a function of the source-drain voltage.

13.4 cm

Subject category :

2. Magnetic Films, Surfaces and Multilayers

Presentation mode :
poster

Corresponding author :
Wojciech I. Babiaczyk

Address for correspondence :
Institute of Molecular Physics, Polish Academy of Sciences,
ul. M. Smoluchowskiego 17, 60-179 Poznań, Poland

Email address :
iwo@ifmpan.poznan.pl