

TOWARDS ATOMIC SCALE INTERCONNECTS WITH A MOLECULAR DEVICE

C. Joachim
GNS CEMES/CNRS
29, Rue J. Marvig,
BP 94347 31055 Toulouse, France
joachim@cemes.fr
www.cemes.fr/GNS/

There is an old nanotechnology interest in interconnecting a single molecule between 2 and recently more than 2 metallic nano-electrodes. While e-beam nanolithography provides a nice technology outcome to interconnect macromolecules like carbon nanotubes or DNA molecules, it is much more demanding to interconnect electronically a single molecule and, at the same time, to determine the conformation of the molecule in the nanojunction and its detail electronic interactions with the junction electrodes.

At the atomic scale and in an ultra-clean environment, we will discuss the first results in this direction, mastering the interconnection of a molecular wire with an atomic metallic wire and the modification of the molecular wire contact end group to increase the contact conductance. At the atomic scale, the next step of performing the same interconnect at the surface of an insulator will be discussed in the perspective of developing a new atom based technology for molecular electronics.

A large part of the results were obtained under the BUN and CHIC IST project and under the AMMIS RTN network.