Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Bi-Stable States in Highly Conductive Pyrazine Molacular Junction G.P. BRIVIO, C. MOTTA, Department of Materials Science, University of Milano-Bicocca, Milano (Italy), S. KANENKO, M. KIGUCHI, Department of Chemistry, Tokyo Instiutute of Technology, Tokyo (Japan), MILANO-BICOCCA COLLABORATION, TOKYO INSTITUTE OF TECHNOLOGY COLLABORATION — Bi-stable molecular junctions are recently deserving attention for their potential in molecular electronics applications. In the present work, we investigate the bi-stable conductance of highly conductive single-molecule pyrazine/Pt junctions. Break-junction measurements show two distinct conductance states of 1.0 G_0 and 0.3 G_0, G_0 being the quantum of conductance. First-principles calculations reveal that the two states could be assigned to different geometrical configurations of pyrazine exhibiting larger and lower coupling with the electrodes, respectively. Inelastic tunneling electron spectroscopy measurements and theoretical analysis of the system vibrations are able to further characterize the configuration dependent conductance of such junctions. We demonstrate that the controlled torsion of the molecule is capable to switch between the two conducting regimes. This process triggered only by mechanical manipulation of the junction is reversible.

G.P. Brivio
Dept of Materials Science, University of Milano-Bicocca, Milano (Italy)

Date submitted: 13 Nov 2012 Electronic form version 1.4