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Reliable anchoring groups for single-molecule junctions M. TERESA GONZÁLEZ, EDMUND LEARY, IMDEA-Nanoscience, CHARALAMBOS EVANGELI, CARLOS ARROYO, GABINO RUBIO-BOLLINGER, Univesidad Autonoma de Madrid, NICOLÁS AGRAÏT, Univesidad Autonoma de Madrid and IMDEA-Nanoscience — In the field of molecular electronics, thiols have been extensively used as the most common anchoring groups to bind molecules to gold electrodes. However, other anchoring groups as amines can provide interesting advantages. Recently, C60 has been also proposed as a possible very efficient binding group. In this talk, I will present our studies on molecular junctions formed by thiol-, amine-, and C60-terminated molecules. We use a STM (scanning tunneling microscope) break-junction technique to create and characterized single-molecule junctions both in ambient and liquid environment. We compare thiols and amines on the alkane family and an oligo(phenylene ethynylene). Our study of the molecular-junction stretching length allows us to conclude that thiols affect atomic rearrangement at the electrodes significantly more than amines. Using C60-terminated molecules, we have recently introduced a new technique for controllably wiring one molecule at a time. We first get STM images to located isolated molecules on a gold substrate, which are then specifically targeted and contacted using a STM gold tip. This technique offers a significant improvement over other techniques, as it guaranties that one and only one molecule is contacted at a time between the electrodes.

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