

Design of New Polyaromatic Scaffolds for Nano-Scale Molecular Electronics

Paula de Mendoza, Thorsten Lauterbach, Catelijne H. M. Amijs, Antonio M. Echavarren
Institute of Chemical Research of Catalonia (ICIQ)
 Av. Països Catalans 16, 43007 Tarragona.
 pmendoza@iciq.es

In the last decade, design and synthesis of polyaromatic scaffolds have attracted much interest due to their exceptional properties and their potential applications in material science [1] and in molecular electronic devices. [2]

PicoInside, an integrated European project, aims at computing inside a single molecule using atomic scale technologies. [3] Our participation consists on the design and synthesis of Y-shaped polyaromatic molecules, like starphenes, that could be applied as molecular *OR logic gates* in an integrated intramolecular circuit.

Herein, we present divergent synthetic approaches for the synthesis of a series of three branched polyaromatic scaffolds that we have designed as promising candidates for their application as molecular switching units. Furthermore, preliminary studies carried out to investigate their properties towards their potential implementation, like deposition on isolating surfaces and LT-UHV-STM images, will be presented.

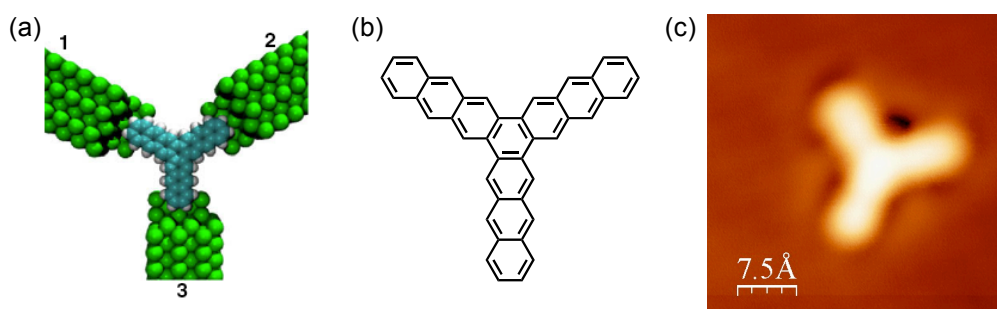


Figure 1: (a) Design, (b) synthesis and (c) LT-UHV-STM image of dianthra[a,c]naphthacene *OR logic gate* molecule.

Acknowledgements. We thank support by the MEC (CTQ2007-60745/BQU, Consolider Ingenio 2010, Grant CSD2006-0003), the AGAUR, European Commission (FP6-015847, Pico-Inside IST Integrated Project) and the ICIQ Foundation.

References:

- [1] Anthony, J. E. *Chem Rev.* **106** (2006) 5028
 [2] (a) Joachim, C. Gimzewski, J. K. Aviram. A. *Nature*, **408** (2000) 541. (b) Jlidat, N. Hilwa, M. Joachim, C. *Chem. Phys. Lett.* **470** (2009) 275.
 [3] Gourdon, A. *NanoLetters* **4** (2006) 22.