



SECOND INTERNATIONAL NANOTECHNOLOGY CONFERENCE ON COMMUNICATIONS AND COOPERATION

Abstract

Molecular-scale electronics : status and perspectives

By Dominique Vuillaum, *CNRS, IEMN, France*

Molecular electronics, i.e. the molecule-based information technology at the molecular-scale, becomes more and more investigated and envisioned as a promising candidate for the nanoelectronics of the future. From this respect, supramolecular assembly of organic molecules on solid substrates is a powerful "bottom-up" approach for the fabrication of devices for molecular-scale electronics. More than a possible answer to ultimate miniaturization problem in nanoelectronics, self-assembled molecular electronics is foreseen as a possible and reasonable way to assemble a large numbers of nanoscale objects (molecules, nanoparticules, nanotubes and nanowires) to form new circuit architectures. It is also an interesting approach to significantly reduce the fabrication costs, as well as the energetical costs of computation, compared to usual semiconductor technologies. Moreover, molecular electronics is a field with a large spectrum of investigations: from quantum objects, for testing new paradigms, to hybrid molecular-silicon CMOS devices. I will review recent results in this field and will discuss some perspectives and challenges.