



Redox monolayers and bistable molecules for memory applications

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In the field of microelectronics, miniaturization of components is a very important issue. However it seems that the industrial processes used for miniaturising electronic devices will soon reach their limits. Therefore, new fields of research are arising. One of them is molecular electronics that exploits the physico-chemical properties of molecules combined to Si technology in order to achieve components with enhanced specifications. The development of new memory devices is thus on its way and different technological approaches are followed:

- a few of them rely on the ability of redox active molecules to loose or gain an electron depending on the potential they are subjected to and thereby tuning the different electrical states of the transistor. At the CEA-Grenoble, one of our current research projects is to anchor redox-active molecules on Si samples for the fabrication of such type of hybrid devices. The molecules and methods developed to obtain these redox monolayers will be presented.

- another approach relies on the use of photo- or electro- chemical switch. We are working on the development of a specific kind of bridled porphyrin that could display such bi-stability behaviour. The researches conducted on these molecules will also be described.