

Po.Di.Me.

Polymeric materials and circuits for Memory Devices

IMAST members involved:

- **University of Naples “Federico II”** – Department of Engineering of Materials and Production (**DIMP**), Department of Physics (**DFS**) and Department of Chemistry (**DC**)
- **STMicroelectronics Srl**
- **CNR - Institute for Composite and Biomedical Materials (IMCB)**

In the framework of the project Po.Di.Me., different classes of functional polymeric materials suitable for the realization of non-volatile memory with bistable behavior have been identified. These materials show an hysterical behavior when subjected to an electric field. This behavior, does not change in time, even it subject to a high number of reading/writing cycles. Emphasis was given to the optimization of the deposition techniques and methodologies of process in order to obtain low-cost devices end easy to industrialize.

Achievements

Two electrodes prototypal devices with crossbar architecture and memory devices with Field Effect Transistor (FET) architecture were realized in order to test the feasibility of electronic applications based on the use of organic semiconductors.

Many technologies for depositing and structuring organic materials have been identified. Their industrial application, technological limitations and the dimensional resolution of materials were evaluated.

In addition, an activity of molecular modeling was developed on the considered systems by using numerical methods suitable for macromolecular systems simulation.

With the feasibility studies, manufacturing process of organic memories has been developed through the use of deposition techniques of organic conductors as a alternative to metal electrodes.

