

Microfuel cell activities of the Micro and Nanosystems department at CNM-IMB

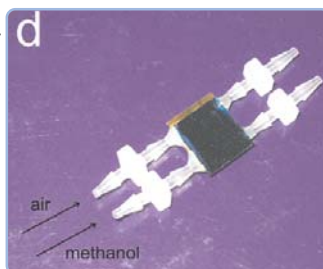
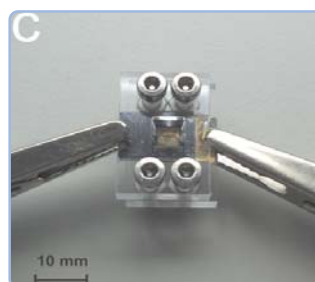
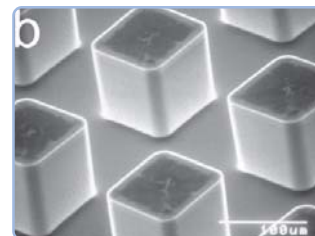
The increasing presence of sensing and actuating microsystems in different application fields (automotive, food industry, security) implies a new demand of light and efficient power sources. Their integration within the devices to be powered arises as the optimal solution regarding both functionality and cost. The obtaining of monolithic integrated devices requires the compatibilization of fabrication technologies. Thus, if integration has to be achieved, the development of specific technologies based on standard fabrication processes will have to be approached.

Within this frame, the **Micro and Nanosystems group from the Centro Nacional de Microelectrónica (CNM-IMB)** started in 2005 a new research line in micropower sources. Taking advantage of its large experience in microsystem design and fabrication, the activities of this group are directed towards the development at a microscale of different kinds of fuel cells like the polymeric electrolyte and the solid oxide fuel cell. *The group benefits from the micro and nanofabrication and characterization services through its Clean Room as well as the electrical/electrochemical characterization and advanced packaging facilities (MCM) available at the CNM facilities.*

First prototypes of direct methanol microfuel cells appeared at the end of 2006. They consist on a hybrid approach, based on commercial membrane electrode assembly sandwiched within silicon microfabricated current collectors. **Figure a** shows a photograph of a processed wafer containing a set of silicon current collector chips. A detail of the microfabricated silicon structures used as microchannels is shown in **figure b**. Both passive and active methanol-based prototypes have been fabricated (**figures c and d**) yielding an average power density of 10 mW/cm^2 at room temperature.

CNM-IMB is open for collaboration with research groups interested in integrating their developments in catalysts or electrolytes in these microdevices in order to improve performance and to obtain a fully integrated micropower source.

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The International Workshop on Micro- and Nano Production Technologies and Systems.

17-18 October 2007, Moscow, Russia; All Russia Exhibition Center, Exhibition Hall 70



The 2-nd International Workshop on Micro- and Nano-technologies and Systems organized by the FP 6 CA **IPMMAN Project** (Improvement of Industrial Production Integrating Macro,- Micro- and Nanotechnologies www.ipmman.eu) and **MINAM Platform** (www.micronanomanufacturing.eu) in the frame of the 5th International Specialized Exhibition on **ROBOTICS, MECHATRONICS, INTELLIGENT SYSTEMS, MICRO- and NANOTECHNOLOGIES** was a great success.

The organization of the **IPMMAN Workshop** was managed by the Institute for Problems in Mechanics Russian Academy of Sciences and by the "Expodesign" Russian Exhibition company.

Topics of the workshop included: micro-nanosystems and technologies; nanomaterials nanosurfaces; nanoparticles and nanolayers; nanostructuring and coating; micro-assembly and integration of macro-/micro-/nano-components; technology integration for macro/micro/nano production.

The Workshop was a forum which highlighted and promoted important ideas in the area of advanced micro-nanotechnologies and systems. Specialists from industry, universities and research institutes were brought together and interacted, discussing future direction of development in the micro- nanotechnology domain, important nanotechnology issues. **The agenda of the event consist in invited papers and presentations.** The talks were focused on theoretical experimental results.



Dr. Ana Almansa Martin, PROFACTOR Research and Solutions GmbH, presenting the last results of WP1 – IPMMAN Project



The IPMMAN Half Year Meeting

19 October 2007, Moscow, Russia, Institute for Problems in Mechanics Russian Academy of Sciences

The WP leaders presented WorkPackages, results of the last 6 months and discussed about future events where MINAM and IPMMAN will be involved and the work to be done in the next period by IPMMAN partners. A special attention will be paid for the lunch of MINAM Platform (Brussels, 24-25 January 2008) and to the participation of more specialists from the European scientific community in the Discussion FORUM, on the IPMMAN webpage www.ipmman.eu/ipmman_forum/.