THE INA COORDINATES ZEOCELL PROJECT (VII FRAMEWORK PROGRAMME, EUROPEAN COMMISSION).

The **INSTITUTE OF NANOSCIENCE OF ARAGON, UNIVERSITY OF SARAGOSSA, SPAIN (INA),** coordinates Zeocell, European project related to the **VII Framework Programme**[1] (European Commission), where research centres and top enterprises from five countries are involved.

Zeocell stands for: **"NANOSTRUCTURED ELECTROLYTE MEMBRANES BASED ON POLYMER/IONIC LIQUIDS/ZEOLITE COMPOSITES FOR HIGH TEMPERATURE PEM FUEL CELLS"**.

The PEMFC technology represents one of the most promising opportunities in the field of the alternative fuels for an environmentally friendly energy production. However, for these fuel cells to become commercially successful there are a number of challenges to be met. One of keys of success of PEMFC technology is the development of improved and mass manufacturable electrolyte membrane materials that can operate at a temperature range of 130-200ºC since it has been proved that, operating at T>120ºC can overcome most of the functional problems currently associated with PEMFC.

The use of composite or heterogeneous materials is a clear research path for the development of improved electrolyte membrane materials. Some material combinations, such as polymer-ionic liquid composites or polymer-zeolite composites, have already been investigated as potential candidates for PEMFC electrolyte membranes.

The kick-off meeting took place in Saragossa last 4th and 5th February, where representatives of the seven partners discussed about the work plan from now on next 36 months (01-01-2008 – 31-12-2010).

ZEOCELL project will develop a **nanostructured electrolyte membrane** based on a **new composite multifunctional material** made by the synergic combination of **zeolites**[2], ionic liquids and polymers that is proposed for the first time within the framework of this project. This

[1] 'Framework programmes' (FPs) have been the main financial tools through which the European Union supports research and development activities covering almost all scientific disciplines. FPs are proposed by the European Commission and adopted by Council and the European Parliament following a co-decision procedure

[2] Zeolites: are hydrated aluminosilicate minerals and have a micro-porous structure.

innovative membrane will be able to operate at **130-200ºC** in high temperature PEMFCs and will show the following features:

Partners: Expert researches in membrane and nanomaterials science and industries with high technological capacities and potential market presence make up the project consortium:

- **INA (Saragossa, Spain)**: is a leader research group in zeolites and nanostructured materials. It will be main responsible for development of one family (small pore) of zeolites and for the construction of the membrane. http://ina.unizar.es/webenglish/ina_en.htm.
- **FORTH-ICE/CHT (Patras, Greece)**: expert institute in porous materials and in the modeling and simulation of structure and transport phenomena in membranes. It will be in charge of development of the second family (large pore) of zeolites and of the modeling of the membrane conduction performance. http://www.iceht.forth.gr/.
- **CIDETEC (Saint Sebastian, Spain)**: expert in electrochemical technologies and materials for electrochemical applications. It will develop thermally resistant polymer materials, fabricate the 2D random nanoporous polymer structures and characterize the membranes in H2-PEMFC and DAFC. http://www.cidetec.es/.
- **UTWENTE (University of Twente, Enschede, The Netherlands)**: university leading group in membrane materials. It will be in charge of the development of PBI and PEEK type polymers. http://www.utwente.nl/en/.
- **CRF (Fiat, Orbassano, Italy)**: The Research Center of FIAT is an expert in technologies on material fabrications and has the equipment for the whole cycle of microstructure fabrication. It will prepare 2D microstructured polymeric matrix whith ordered nanoporous filled up with ionic liquids. http://www.crf.it/.
- **SOLVIONIC (Toulouse, France)**: A very high technology SME in the field of ionic liquids will be responsible of the preparation and characterization of the Ionic Liquids. http://www.solvionic.com/.
- **CEGASA (Vitoria, Spain)**: is an important battery manufacturer business group, with a strong presence in international markets. It is currently developing a new business area in PEMFC. It will make the analysis of the new membrane mass manufacture. http://www.cegasa.com/.