

MATGAS: a center of excellence on CO₂

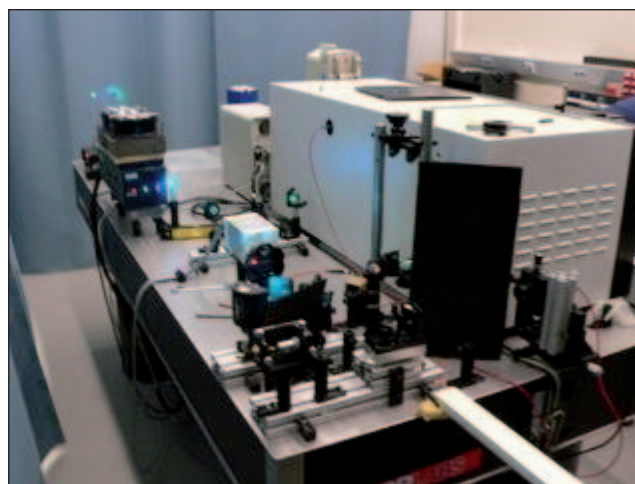
MATGAS is a non-profit, research organization, born as a joint venture among Carbueros Metálicos- Air Products Group, the Spanish National Research Council (*Consejo Superior de Investigaciones Científicas-CSIC*) and the Autonomous University of Barcelona (*Universitat Autònoma de Barcelona-UAB*). It is one of the founder members of the Barcelona Nanotechnology Cluster.

MATGAS aim is to become a world leading and recognized centre of excellence in the use of combined modeling-experimental approaches for the development of CO₂ capture and application technologies, as well as energy related issues. MATGAS will contribute at different levels in the research and development of green technologies, friendly with the environment. This includes the development and characterization of materials for energy and environmental applications.

MATGAS activity is held in a modern building located at UAB campus. The research developed with the above mentioned goal is carried out in six main laboratories, set with last generation equipments:

- a) Nanotechnology Laboratory, a last generation lab aimed to provide the needed techniques for the characterization of materials at the nanoscopic level. This allows developing technologies that exploit the specific properties of the materials at the nanometer scale. Examples of recent projects include the characterization of organic materials for photovoltaic applications, characterization of nanoparticles for different applications and measurements of phase transitions at the nanoscale.
- b) Supercritical Fluids Laboratory, which aims at promoting research and development of new applications of supercritical fluids or fluids at high pressures and temperatures. Recent applications of the Supercritical Fluids technology at MATGAS include: extraction and concentration of natural products, development and purification

- of synthetic materials and catalysts, enhancement of drug delivery systems and dry cleaning.
- c) Gas Reactivity Laboratory, designed to study the reactivity and adsorption of a variety of gases into liquids and/or solid materials over a wide range of pressures and temperatures. Some recent projects include the characterization of adsorbent materials for CO₂ capture and hydrogen storage.
- d) Computational Modeling Laboratory, a permanent calculation infrastructure to provide support to MATGAS projects from a modeling perspective. Simulations done in this lab help to obtain a deeper understanding of properties and processes at the nanoscale. Examples of recent projects include simulations hydrogen storage in carbon nanostructures, deposition of copper layers as electrical contacts in microelectronics, or the optimization of nanoparticle dispersions.
- e) MATGAS also offers an Energy Laboratory and a High Bay Area which are currently under expansion.



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