MATGAS - MATERIALS PROCESSING WITH GASES

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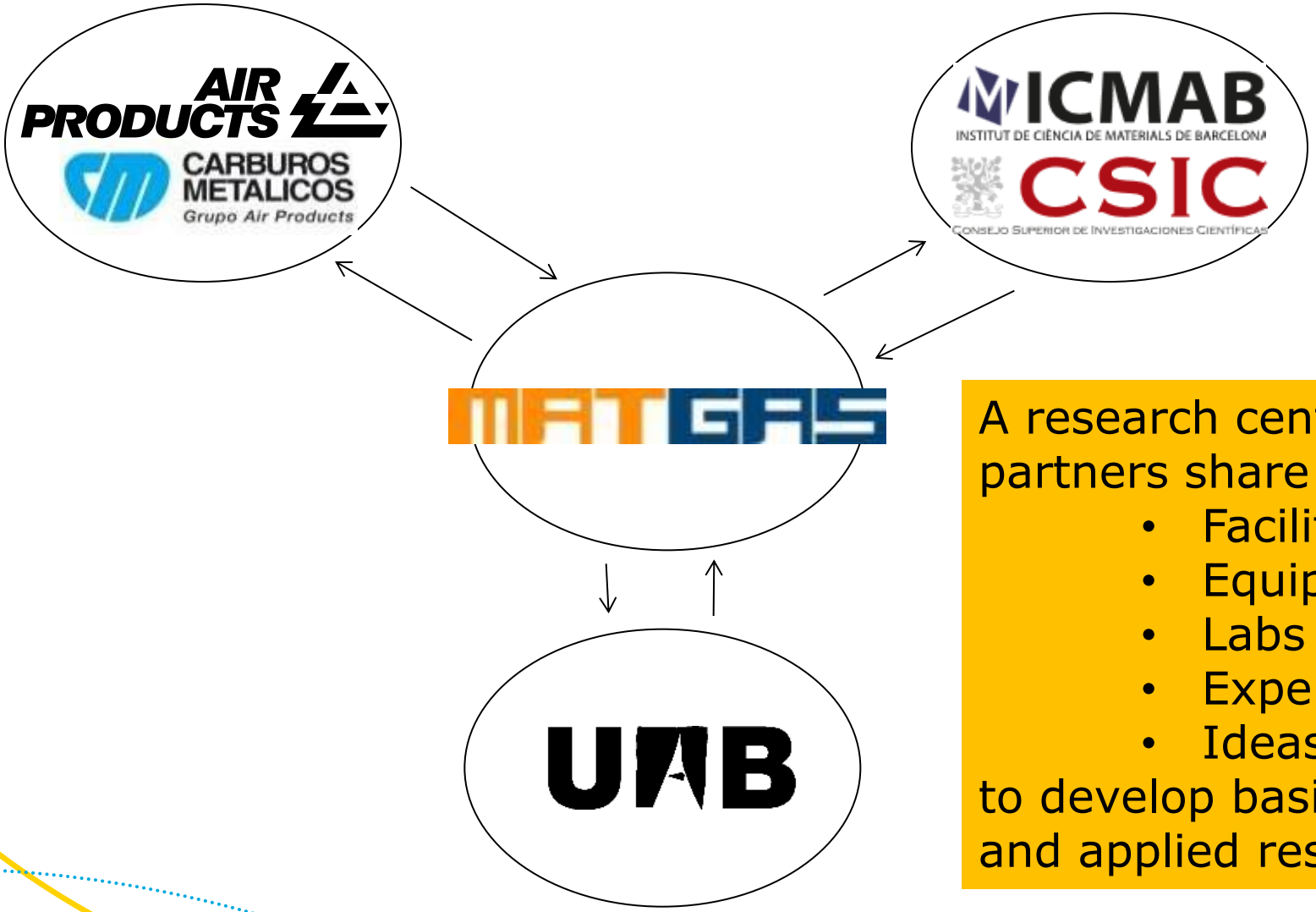
MATGAS
Research Center for Materials/Gases



A research center were the partners share:

- Facilities
- Equipment
- Labs
- Expertise
- Ideas

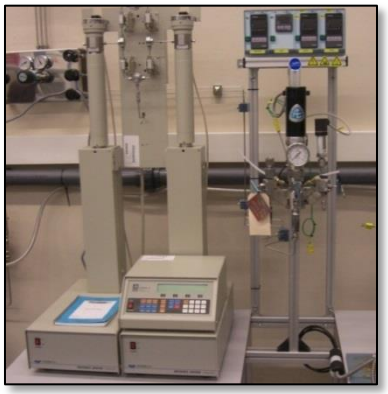
to develop basic, exploratory and applied research.

Supercritical CO_2 Laboratory

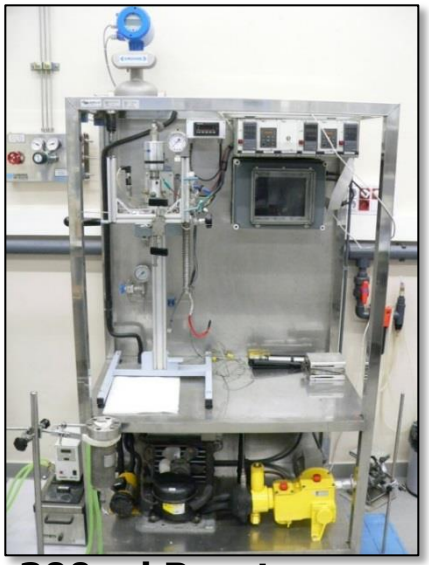
Laboratory operated since 1997, first as collaboration between Carburos and ICMAB and nowadays as MATGAS shared Lab.

Others equipment belonging to partners are already accessible. As well as different type of particle and suspensions analyzers

100ml Reactor:
- 200Bar@200C
- Agitation
- 25mlCO_2/min



Pilot Plant:
- 4 reactors:
  - 16L 500Bar@100C
  - 2L 500Bar@400C
  - 2x1L 350Bar@400C
- 40 kg/h CO_2
- 2 L/min Cosolvent



300 ml Reactor:
- 227Bar@400C
- Agitation
- 2 Kg CO_2/h

Variable Volume Full Visible View Cell:
- Volume 20-50ml
- 300Bar@-40/100C

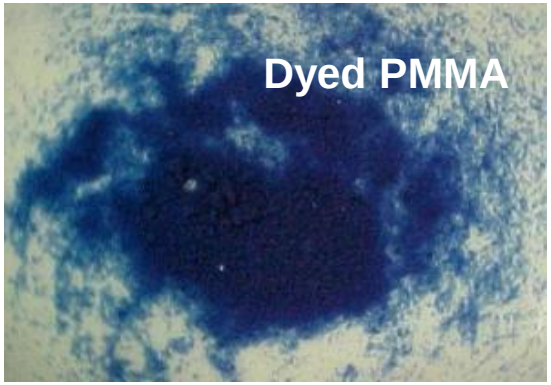
Introduction to Supercritical CO_2

Above the critical point (73 bar@31 C), CO_2 behaves like an organic solvent and can be considered as an alternative to replace organic solvents.

The technology is already used at industrial scale in food, chemical, pharma among others.

Main applications related to materials processing:

- Extraction and separation of natural products (defatting, decaffeination, nutraceuticals)
- Micronization as alternative to milling (particle down to 1 µm)
- Encapsulation of substances
- Dry Cleaning (clothes, metals, electronics, tires)
- Impregnation and dying of textile, polymers and wood
- Drying - removal of solvents, even water
- Decontamination of materials (Cork, soils and polymers)



Green Energy Laboratory

Laboratory **dedicated to the development of alternative energies**, able to reduce the carbon footprint and environmental impact of the energy segment.

In the past, dedicated to the characterization:

- catalyst for greener fuels
- membranes for fuels cells
- materials for CO_2 capture

Nowadays, **focused on the research and development of new batteries**, mainly on the characterization of the aging of batteries by performing charge/discharge cycles.

Support on improvement of fuels and recovery or recycling of lubricant by hydrogenation from other partners labs.

UAB ICMAB INSTITUT DE CIÈNCIA DE MATERIALS DE BARCELONA CSIC CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS AIR PRODUCTS CARBUROS METALICOS Grupo Air Products MATGAS

Expertise on gas application for material processing

Processing of plastics:

- Cryogenic grinding for plastic recycling or ultrafine powder production
- Curing of tires
- Sterilization of medical devices
- Cryogenic separation for plastic recovery
- Gas assisted blowing or injection
- Fluorination for reduced permeation of solvents or increased adherence of paints

Processing of metals:

- Controlled atmospheres for metal protection or improved productivity in welding/cutting

Environmental protection:

- VOC or Solvent recovery by Cryogenic condensation
- Catalyst regeneration

Thank you
tell me more