AIMPLAS CAPACITIES IN HYDROGEN

AIMPLAS, Technological centre of plastics

Research Centre

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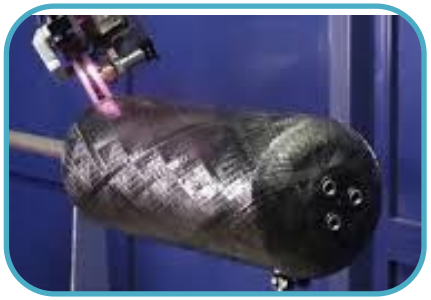
1. Capacities

H_2 Production



Storage

Advanced materials

H_2 Use

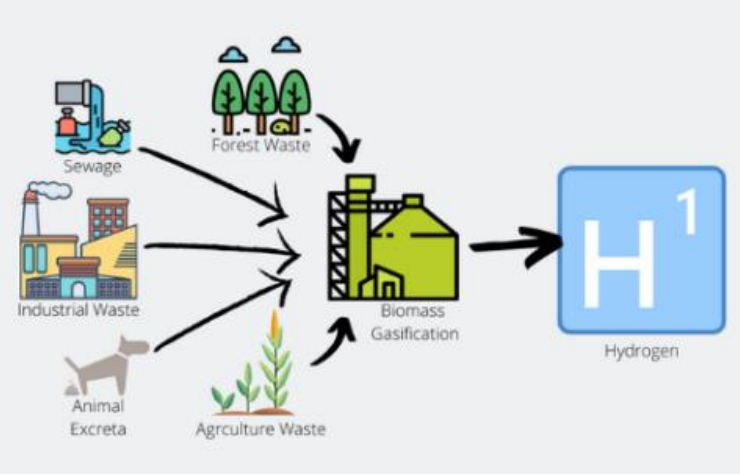
1. Capacities

H_2 Production

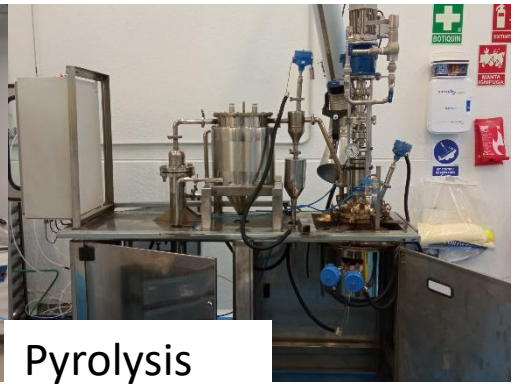
Biomass

Plastic waste

- Pretreatment
- Catalysts synthesis
- In-situ capture of CO_2 (Sorption Enhanced process)



Gasification



Pyrolysis

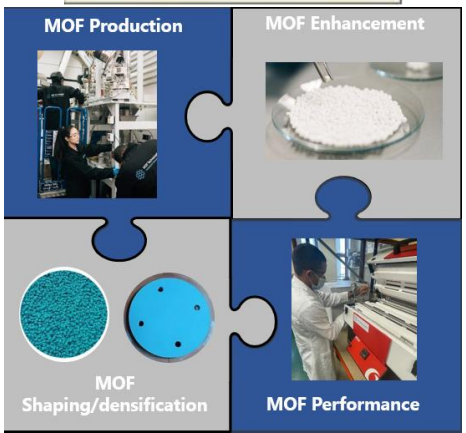
H_2: 42-54%

1. Capacities

H_2 Storage

Compression H2

Tanks/pipes/Porous materials



Liquid H2

Foams with low conductivity

Q (molm/(m²sPa) at 105 bar
$1{,}040 \cdot 10^{-16}$-$9{,}625 \cdot 10^{-17}$

Foams with conductivity <0,03 W/mK

Carriers

LOHC, MeOH,NH3, FORMIC

Synthesis of catalysts for hydrogenation/dehydrogenation

1. Capacities

H_2 Uses

Synthesis of renewable synthetic fuels by different technologies

High Pressure Batch Reactors

Autoclaves 100mL x 4

- Magnetic stirring
- T_{max} = 250 ºC
- P_{max} = 150 bar

Autoclave 300 mL

- Magnetic stirring
- T_{max} = 360 ºC
- P_{max} = 344 bar

Multireactor (8 x 7 mL)

- Magnetic stirring
- T_{max} = 250 ºC
- P_{max} = 100 bar

High Pressure Flow Reactors

Conventional Thermal Heater

- T_{max}: 500ºC
- P_{max}: 60 bar
- Max flow: 100 ml/min
- 4 inlet gases
- Condensation pot
- HPLC pump for continuous liquid addition

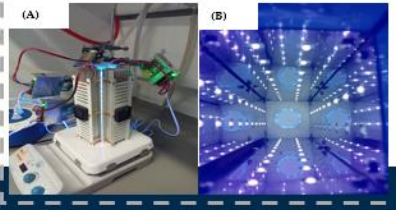
Microwave reactor

- T_{max}: 500ºC
- P_{max}: 60 bar
- Max flow: 100 ml/min
- 4 inlet gases
- Condensation pot
- HPLC pump for continuous liquid addition

Electrochemical Flow Reactor

- 2 Filter/Press reactor in serial configuration
- Impedance module: 10µV – 7,5 V
- Potensiostat/Gavalnostat module of 20 V, from 50µA to 5A
- CO_2 conversion to: CH_4, N_2, CO, C_2H_4
- Flow range: 0-100 ml/min

Photochemical Reactor



- LED PCBs modules
- Light emission centered λ=365nm

(A) External reactor photo
(B) Internal Reactor photo

2. Topics of interest in calls 2025

Topic	Experience and Contribution
HORIZON-JU-CLEANH2-2025-01-01: Improvements in lifetime and cost of low temperature electrolysers by introducing advanced materials and components in stacks and balance of plant	Electrocatalysts and electrodes with advanced materials
HORIZON-JU-CLEANH2-2025-02-02: Development of cost effective and high-capacity compression solutions for hydrogen	Advanced materials for H2 storage. Porous materials, materials for tanks
HORIZON-JU-CLEANH2-2025-02-03: Demonstration of scalable ammonia cracking technology	Catalysts for ammonia cracking