

Low-pressure CO₂ Capture technology for biogas upgrading



Timeline | 12/2022 to 11/2024



ICIQ People | [J. R. Galán-Mascarós Research Group](#)



Budget | 149.500,00€



Call | Pruebas de Concepto 2022

SUMMARY

TAMOF-1, a high surface-area (BET > 1200 m²/g) metal-organic framework has shown a high selectivity towards CO₂, with robust thermal, chemical and mechanical stability and cyclability. Breakthrough data confirms this material is able to separate CO₂ from a variety of permanent gases, including N₂ O₂, H₂, CO and CH₄, while operating at low (ambient) pressure, and offering low-energy/low-cost options for regeneration. These features opens the possibility to use TAMOF-1 as the basis for a novel technology for CO₂ capture.

Through **COCAP** we propose to move through the next steps to bring this technology further to market: 1) processing of TAMOF-1 as mechanically-stable pellets to operate with industrially relevant flow rates; 2) optimizing the performance of adsorption columns packed with TAMOF-1 pellets; 3) designing, building and testing a pilot plant to capture CO₂ from a gas stream mimicking the emissions from the fermentation industry; 4) assessing the techno-economic viability of a full-scale technology; 5) identifying the most promising market opportunities based on the corresponding technoeconomic analysis. The unique low pressure, low-energy operation conditions offered by TAMOF-1 are expected to increase capture rates, while reducing energy consumption and costs by a significant margin when compared with current, competitive CC commercial technologies.

WORK PLAN

WORK PACKAGES	Year 1	Year 2
TASK 1. TAMOF-1 PELLETS		
TASK 2. COLUMN PERFORMANCE		
TASK 3. MINI-PILOT PLANT		
TASK TECHNOECONOMIC ASSESSEMENT		