



MOF4AIR Project

Newsletter #1 - September 2021

Welcome to the first newsletter of the MOF4AIR project, to keep you updated on our progress.

MOF4AIR is an H2020 project gathering 14 partners from 8 countries to develop and demonstrate the performances of MOF-based CO₂ capture technologies in power plants and energy-intensive industries.

The project is coordinated by the University of MONS and will last from July 2019 to June 2023. MOF4AIR has a budget of 11.1 M€ with 9.9M€ of EU contribution through the Horizon 2020 funding programme.



*Visit our website for more information on the project objectives and activities.
Follow us on Twitter and LinkedIn to be the first to know about MOF4AIR latest development and news.*

What is MOF4AIR ?

The overall objective of MOF4AIR is to demonstrate the performances of MOF-based CO₂ capture technologies in power plants and energy intensive industries.

To that purpose, MOF4AIR will demonstrate optimized MOF-based adsorbents with fine-tuned CO₂ adsorption processes through a multidisciplinary approach.

You can find more explanations on our website about:

- [MOF4AIR main concepts](#) (new content!)
- [Carbon Capture Utilisation and Storage \(CCUS\)](#)

What is new ?

September also means the end of summer break for MOF4AIR project, which celebrated its **2 years of existence in July.**

We kick-started this month with our monthly consortium meeting, which was the opportunity for MOF4AIR partners to exchange on the progress made over the summer.

This newsletter gives us the opportunity to now share the progress made by the different Work Package with you, and to suggest you some events to attend!

Work Package progress

You can find below the progress of our partners on each MOF4AIR Work Package!



Work Package 1

Identification of the most adequate processes and MOFs

Participants: **CNRS, UMONS, SINTEF, POLIMI, CRES, SIKEMIA, MOFTECH, KRICT, TCM, SOLAMAT, TUPRAS, TCMA**



To develop energy-efficient CO₂ capture solution, MOF4AIR partners have pre-selected more than 20 known MOFs offering high selectivity, high working capacity and low regeneration energy. Special attention was paid to the potential chemical stability of these MOFs. This work package is now over.



Work Package 2

Validation of the best MOFs

Participants: **CNRS, UMONS, SIKEMIA, MOFTECH, KRICT**



Behaviour of a wide range of MOFs under a gas flow, like those of carbon-intensive industries, was analysed combining adsorption experiments, operando techniques and computational approaches. Finally, 5 MOFs have been preselected for up-scale and industrial applications! This work package is now over.



Work Package 3

Validation of the shaped material in lab

Participants: **UMONS, SINTEF, CNRS, SIKEMIA, MOFTECH**



In WP3, MOFs selected in WP2 are being prepared for synthesis at larger scale and shaped! Stability and structural properties of both scale-up and shaped materials are checked, and adsorption equilibrium and kinetics of shaped material are determined.



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Work Package 4

Modelling and techno-economic numerical optimisation

Participants: **SINTEF, UMONS, CNRS, POLIMI, CRES**



WP4 led by SINTEF aims to computationally screen MOFs for adsorption, perform process simulations and carry out detailed cost analysis of VPSA and MBTSA processes. This will help to choose the right MOF for the experimental demonstration! This work package is in progress and we will know very soon our best candidates.



Work Package 5

Validation of the selected separation technology in relevant environment

Participants: **SINTEF, UMONS, CNRS, POLIMI, SIKEMIA, MOFTECH KRICT, ENGTECH, TUPRAS**



WP5 led by SINTEF aims to demonstrate the Carbon Capture technologies in a lab-scale environment. The 4 chosen MOFs will be shaped and used in lab-scale pilot VPSA and MBTSA demonstration units! It will provide know-how on the design needed for TRL6 demonstration process.



Work Package 6

Scale up and demonstration in an industrial environment

Participants: **TUPRAS, UMONS, SINTEF, SIKEMIA, MOFTECH, KRICT, ENGTECH, TCM, SOLAMAT**



Tupras, TCMCO₂ and Solamat Merex will welcome MOF4AIR pilot units in 2022 for demonstration of CO₂ capture from flue gases using VPSA technology at TRL6.



Work Package 7

Techno-economic and environmental analysis

Participants: **CRES, UMONS, SINTEF, POLIMI, MOFTECH, TUPRAS, EQY, TCMA**



This WP consists in the assessment of the legislative and regulatory framework on capture, transport, and storage systems of CO₂ - In MOF4AIR participating countries, as well as at EU level. Based on this review, a series of recommendations have been proposed!

Work Package 8

Transferability, replicability, and social issues

Participants: **CRES, UMONS, CNRS, SIKEMIA, TCM, TUPRAS, EQY, TCMA**



Social acceptance is a prerequisite for the further development of CCS ! In this context, CRES (Centre for Renewable Energy Sources and Saving in Greece) is exploring social issues related to CCS within the MOF4AIR project.



Events in September

MOF4AIR participates in the **4th EuroMOF Conference on Metal Organic Frameworks and Porous Polymers**, held virtually in Krakow between the 13th and the 15th of September.

This is the opportunity for MOF4AIR partners to present their work on MOFs:

- The **GRAMOFON project** will be presented by the University of MONS and CNRS
 - GRAMOFON is a H2020 project on MOFs and post-combustion CO₂ capture process. This project terminated in 2020, and involved several partners of MOF4AIR
- Shreenath Krishnamurthy from MOF4AIR partner SINTEF will present the **MIL-91-Ti adsorbent for post combustion carbon capture**

The MOF4AIR will also be presented at the **6th H2020 CCUS/Alternative fuels workshop**, organised by the European Commission Executive Agency for Climate, Infrastructure and Environment (CINEA) on the 23rd and the 24th of September.

What's next?

The following months will see the constructions of **our three demonstrations sites**.



TCM – Mongstad, Norway
A MOF4AIR demonstration site for power plant and Residue Fluid Catalytic Cracker (RFCC)

TUPRAS – Izmit, Turkey
A MOF4AIR demonstration site for furnace-boiler



SOLAMAT-MEREX – Marseille, France

A MOF4AIR demonstration site for hazardous industrial waste incineration

Stay tuned for more information about MOF4AIR demonstration activities in our next communication campaign on social media! In the meantime you can learn more about [our demonstration sites on our website](#).



Our project partners



MOF Technologies
Adsorbent Nanomaterials



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