

Conference Presentations and Trade-Show Exhibitions

CCUS Innovation 2.0

Key Knowledge Deliverable 6.5

Key Knowledge Deliverable Cover Sheet

This Key Knowledge Deliverable (KKD) has been produced by Promethean Particles Ltd. as part of the Department for Energy Security and Net Zero £1bn Net Zero Innovation Portfolio (NZIP) - CCUS Innovation 2.0 programme. The document is reflective of the status of the project at the time of writing. The material presented could have been subject to change as the project matured. These documents should not be considered a full representation of the final project.

Description of KKD D6.5 - Conference Presentations and Trade-Show Exhibitions

Within WP6 (Commercialisation, Exploitation, Dissemination), Task 6.2 (Dissemination Activities) aims to promote the scope, aims and achievements of the MONET project. While the technical work packages (WPs 1-4) focus on developing the technology, WP6 targets the communication of project activities to external stakeholders, thereby increasing their likelihood of successful exploitation and commercialisation beyond the project duration. This deliverable report lists conferences and trade-show exhibitions attended, where knowledge associated with Project MONET was disseminated. Attached as an annex are copies of posters, presentations, and publicly published material captured within this deliverable.

As part of the work in T6.2, this deliverable report D6.5 (Conference Presentations and Trade-Show Exhibitions) contains a summary of the key results and conclusions of the project disseminated through conference presentations and trade-show exhibitions. Final output will be a variety of materials released into the wider domain.

KKDs to be released in full:

D6.4 - Marketing Material Creation

D6.5 - Conference Presentations and Trade-Show Exhibitions

KKDs to be released after redaction:

D3.2 - Control and Safety System Manufacturing

D3.4 - Build of Capture Rig

D4.1 - Installation of Capture Rig

D4.3 - Rig Operation and Decommissioning

D5.1 - CAPEX Technoeconomic Analysis (TEA)

D5.2 - OPEX TEA

D5.3 - Life Cycle Analysis (LCA)

D6.6 - Stakeholder Analysis



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Events Attended

1. EuroMOF2023, Granada, Spain – 24th – 27th September 2023 – Dr Scott Priest (Promethean Particles)
2. PorMat 2024, Liverpool, UK – 4th-5th June 2024 – Dr Leah Matsinha Poster Presentation(Promethean Particles)
3. PorMat 2024, Liverpool, UK – 4th-5th June 2024 – Rebecca Ryder Matsinha Poster Presentation (Promethean Particles)
4. MOF2024, Singapore – 15th-19th July 2024 – Dr Paul Kirkman Oral Presentation (Promethean Particles)
5. MOF2024, Singapore – 15th-19th July 2024 – Dr Selina Ambrose Presentation (Promethean Particles)

For each event attended, an associated supporting document is available. See the Annex list below.

Attached Documents Annex List

Annex 1 - D6.5 Scott Priest EuroMOF2023 Poster Presentation

Annex 2 - D6.5 Leah Matsinha PorMat 2024 Poster Presentation

Annex 3 - D6.5 Rebecca Ryder PorMat 2024 Poster Presentation

Annex 4 - D6.5 Paul Kirkman MOF2024 Oral Presentation Slides

Annex 5 - D6.5 Selina Ambrose MOF2024 Oral Presentation Slides

Annex 1 - D6.5 Scott Priest EuroMOF2023 Poster Presentation



SCALE-UP OF A CONTINUOUS, ROOM-TEMPERATURE SYNTHESIS OF HKUST-1 AND DEMONSTRATION IN A CARBON CAPTURE AND STORAGE (CCS) APPLICATION

Scott Priest, Venus So, Rebecca Ryder, Paul Kirkman and Selina Ambrose
Promethean Particles Ltd.

Email: Scott.Priest@proparticles.co.uk

HKUST-1 for CCS

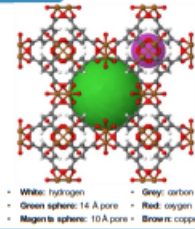
- Formula unit = $\text{Cu}_3(\text{BTC})_2$
- Open-metal sites within the pores act as CO_2 adsorption sites

Exceptional CO_2/N_2 selectivity

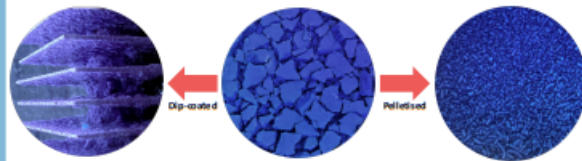
High CO_2 adsorption capacity

Relatively inexpensive precursors

Relatively low regeneration temperatures



HKUST-1 Shaping



Retained performance after shaping

Robust pellets

Batch Synthesis

Typical solvothermal methods

50 – 100 °C
Ambient pressure
Several hours

HKUST-1
BET SA: ~1,600 $\text{m}^2 \text{g}^{-1}$
Yield: 50-90%

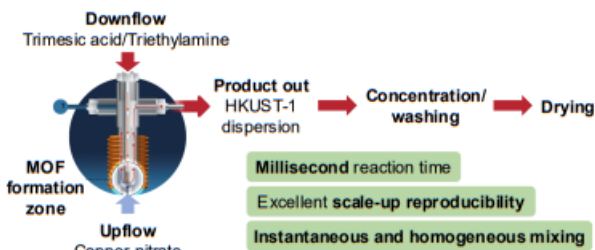
Difficult to scale-up

Batch-to-batch variability

Wide particle size distribution

Continuous Flow Manufacturing

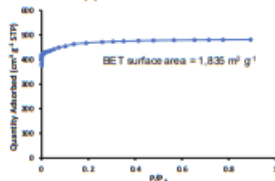
Promethean's proprietary counter-current reactor^{1,2}



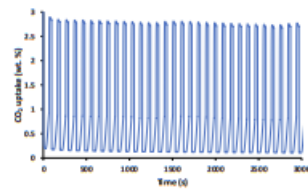
Millisecond reaction time

Excellent scale-up reproducibility

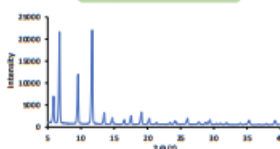
Instantaneous and homogeneous mixing



High surface area



Stable humid air cycling in 15% CO_2



High crystallinity



Narrow particle size distribution

PICASSO CCS Project

Pilot Scale Carbon Capture using Solid Sorbents (PICASSO) outline

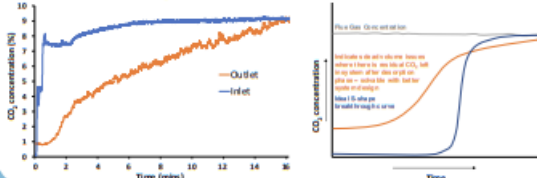
- CCS project at DRAX incubation site
- Real flue gas from DRAX's Biomass based power generation on-site
- Temperature swing adsorption
- Tens of kg scale MOF for CCS
- MOF casted heat-fins for heat transfer



PICASSO outcomes

- Selective CO_2 adsorption demonstrated at scale
- Temperature swing not ideal due to low thermal conductivity of MOFs
- Low void space required to get correct "S" curve of breakthrough

HKUST-1 breakthrough results



MONET CCS Project

MOF-based Negative Emissions Technology (MONET) outline

- Follow-on CCS project from PICASSO at the DRAX incubation site
- CCS trial for 2024
- 100 kg of selected MOF to be used in a fully-automated prototype carbon capture unit
- Pressure swing adsorption
- MOFs pelleted for robustness and packing density with minimal pressure-drop
- The MONET project is funded by the Department for Energy Security and Net Zero as part of Call 2 of its CCUS Innovation 2.0 competition



Real flue gas

100 kg of MOF for CCS

Pressure swing adsorption

Conclusions and Future Work

- ✓ High quality HKUST-1 can be synthesised at room temperature in continuous flow
- ✓ Successfully scaled up to 25 kg production

- ✓ Shaped without reduction in performance
- ✓ Used in an industrial scale trial CCS demonstration rig (PICASSO Project)
- Future scale-up to 100 kg CCS unit (MONET Project)

References

1. M. Gimeno-Fabra, A. S. Munn, L. A. Steven, T. C. Drage, D. M. Grant, R. J. Kashtiban, J. Sloan, E. Lester and R. I. Walton, *Chem. Commun.*, 2012, **48**, 10642-10644.
2. *UK Pat.*, WO2005077505A3, 2005.

Annex 2 - D6.5 Leah Matsinha PorMat 2024 Poster Presentation



Project MONET: Demonstrating the Industrial-Scale Viability of MOF-Based Carbon Capture

Leah Matsinha, Paul Kirkman, Selina Ambrose, Rebecca Ryder, Scott Priest

leah.matsinha@proparticules.co.uk, Promethean Particles Ltd., United Kingdom.

MOFs for Carbon capture: Laboratory to Pilot-Scale

- Laboratory scale demonstrations using pure gas
- Laboratory scale demonstrations using mixed gases
- Pilot-scale demonstration using flue gas

Thermogravimetric analysis
CO₂ isotherm measurements

Breakthrough Analysis

Project MONET

- Promethean has the capability to produce MOFs on a large-scale.
- MOF CO₂ uptake capabilities have been tested on a laboratory scale using pure CO₂ or CO₂/N₂ gas mixtures.
- MOF performance in carbon capture & storage (CCS) needs to be demonstrated using flue gas.
- This project describes the utilization of shaped *ProMOF™ 9100 in a prototype CCS unit in post-combustion carbon capture.

CO₂ Uptake Capabilities Under Variable Conditions

CO₂ uptake for ProMOF 9100

Scale	CO ₂ uptake (mmol/g)
Pilot scale production	3.93
Large scale production	3.72

Breakthrough curves for ProMOF 9100 (N₂/CO₂ mixtures)

Normalized Outlet CO₂ conc. (ppm)

Time (s)

CO₂ uptake results from thermogravimetric analysis using pure CO₂

CO₂ uptake results from breakthrough analyzer using CO₂/N₂ mixtures

Project MONET

Demonstrations with flue gas and Promethean's prototype CCS unit.

- CO₂ uptake?
- Effect of contaminant particles?
- Effect of moisture?
- MOF stability?
- MOF regeneration?

What is Missing?

Demonstrations with flue gas under real conditions.

MOF Production by Promethean Particules

MOF Structure

MOF Pellets

Clean Flue Gas

MOF Sorbent Beds

MOF Regeneration

Flue Gas

CO₂ Capture

CO₂ Storage

Transport

Utilisation

Underground Sequestration

MOF-based Negative Emissions Technology (MONET) project is a pilot-scale demonstration of the utilization of MOF solid sorbent (ProMOF 9100) for carbon capture from Drax power station flue gas.

- Promethean has produced and shaped 100 kg of ProMOF 9100 and this will be used as the CO₂ solid sorbent.
- A prototype CCS unit has been designed and fabricated.
- MOF sorbent will be 'packed' in the CCS prototype unit and connected to Drax's flue gas exhaust system. The following will be investigated:
 - CO₂ uptake of MOF sorbent.
 - MOF stability and regeneration.
 - Effect of moisture, other gases and particulate matter in the flue gas on MOF sorbent.

Large-Scale Production of ProMOF 9100

Scale	Production Rate	Status
LABORATORY SCALE	g/hr	Internal R&D Complete
PILOT SCALE	kg/hr	Proof of concept Demonstrations Complete
PRODUCTION SCALE	kg/min	Commercialisation Pilot System Demonstrations Ongoing

- Kilograms of shaped MOF.
- No loss in CO₂ uptake.
- Desirable mechanical properties.

Life Cycle & Technoeconomic Assessments

RECYCLING

RAW MATERIALS

MOF PRODUCTION

DISTRIBUTION

USE PHASE

LANDFILL

MOF LIFECYCLE

The assessments will analyze the environmental and economic impacts of ProMOF 9100 at each phase of its life.

Drax Incubation Facility

Other gases

CO₂

Flue gas stream

Decarbonized flue gas

Captured CO₂

MOF Pellets

At Drax, Promethean's CCS prototype unit will be connected to flue gas exhaust for post-combustion carbon capture using MOF as solid sorbent.

Conclusions and Future Work

- ✓ The production and forming of ProMOF 9100 on a 100 kg scale has been demonstrated.
- ✓ A CCS prototype rig has been designed and fabricated for utilization in post-combustion carbon capture.
- Efficacy of the MOF sorbent in carbon capture from flue gas will be tested.
- A life cycle assessment (LCA) and technoeconomic assessment (TEA) of the process will be performed.

*ProMOF 9100 is a MOF with a UTSA-type structure.

Acknowledgements

Project MONET is funded by the Department for Energy Security and Net Zero as part of Call 2 of CCUS innovation 2.0 competition.

Annex 3 - D6.5 Rebecca Ryder PorMat 2024 Poster Presentation



Concept to Reality: Maintaining the Performance of MOFs in Functional Forms

Rebecca Ryder, Scott Priest, Angela Avendano, Owen Cartmell and Paul Kirkman

Rebecca.Ryder@proparticles.co.uk, Promethean Particles Ltd., United Kingdom.

ProMOF™ 9100 for Carbon Capture

- Formula unit = $KM_3(\text{cit})_2$
- M = Co or Zn
- Mixed metal approach yields **accelerated formation** compared to Co only¹
- Contains both **octahedral** and **tetrahedral** sites
- K⁺** ions within the pores act to **polarise CO₂** and as a **binding site**
- Presence of **K⁺** increases **CO₂ adsorption capacity**

Inexpensive precursors

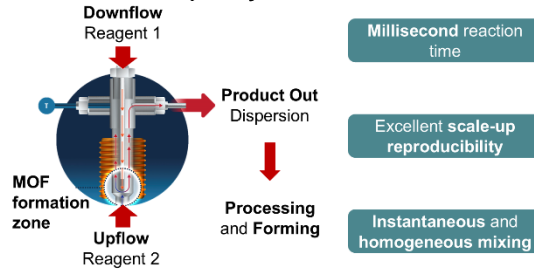
Excellent stability

Exceptional CO₂/N₂ selectivity

Mild regeneration conditions

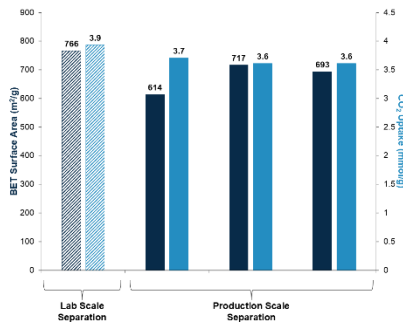
Continuous Flow Manufacturing

Promethean's Proprietary Counter-Current Reactor²



Processing Scale-Up

- As synthesised dispersion **washed** with a solvent mixture
- Industrial **filtration system** utilised to convert into a **wet cake**
- Subsequent **drying and milling** resulted in a **fine powder**



Comparable performance at large-scale

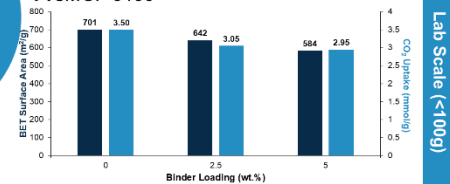
100m²/g variability in BET surface area

Production Milestones So Far

- 250kg** Synthesised (dry weight equivalent)
- 370kg** Cake (67.6 wt.%) processed and dried
- 250kg** Milled to a powder
- 125kg** 50% of material converted to 3mm pellets

Forming Development

- Polymeric binder** chosen due to **low cost, high availability and compatibility** with ProMOF 9100*



Binder-less pellets highly friable

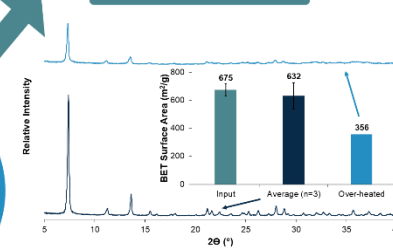
12-15% performance loss with binder addition



Pellets blacken at elevated drying temperature

Crush strength >14N on average

1.5wt% binder utilised



Lower crystallinity and surface area

Likely due to onset of binder decomposition at T2

Lab Scale (<100g)

Production Scale (>100kg)

Conclusions and Future Work

- Multi-hundred kg-scale synthesis and pelleting of ProMOF 9100 demonstrated with **comparable performance** to lab-scale
- Pellets developed to a **standard equivalent** to commercial **molecular sieves** with respect to **mechanical strength**
- Further investigate **drying conditions** on pellet properties
- Conduct **accelerated cycling** under **application testing conditions** to monitor **durability** of pellets
- Focus on **diversifying form factors** to widen application scope

References

- S. B. Peh, S. Xi, A. Karmakar, J. Y. Yeo, Y. Wang and D. Zhao, Inorg. Chem., 59, 9350–9355, 2020
- UK Pat., WO2005077505A3, 2005.

*ProMOF™ 9100 is a UTSA-16 structure.

Acknowledgements

This work was completed for the MOF-based Negative Emissions Technology (MONET) project. Project MONET is funded by the Department for Energy Security and Net Zero as part of Call 2 of the CCUS Innovation 2.0 competition.



Annex 4 - D6.5 Paul Kirkman MOF2024 Oral Presentation




PrometheanParticles™

Minding the Gap: Sustainable MOF Production at an Industrial Scale

Paul Kirkman *PhD CChem*

R&D Manager, Promethean Particles
18th July 2024



9th International Conference on
Metal-Organic Frameworks and
Open Framework Compounds

★★★★
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Promethean's Vision

To become the world's largest
supplier of **industrial scale,**
high quality, cost-effective
metal-organic-frameworks
(MOFs)





**Industrial
Scale**



**High
Quality**



**Cost
Effective**

Promethean's Proprietary Reactor Technology

MOF 2024 – 18th July 2024, Singapore

2

Industrial Scale



Largest of its kind continuous-flow MOF manufacturing facility

~1,000 tonne/year reactor capacity

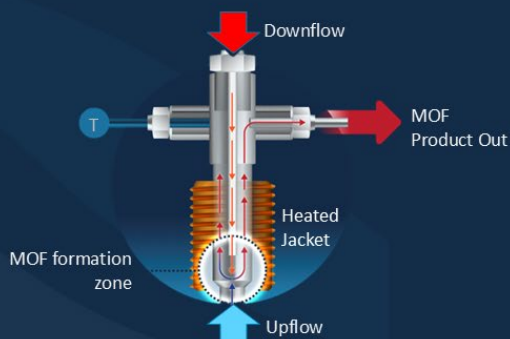
Additional 10X increase enabled by new reactor design

Large scale directly impacts cost-effective production

MOF 2024 – 18th July 2024, Singapore

3

Cost Effective



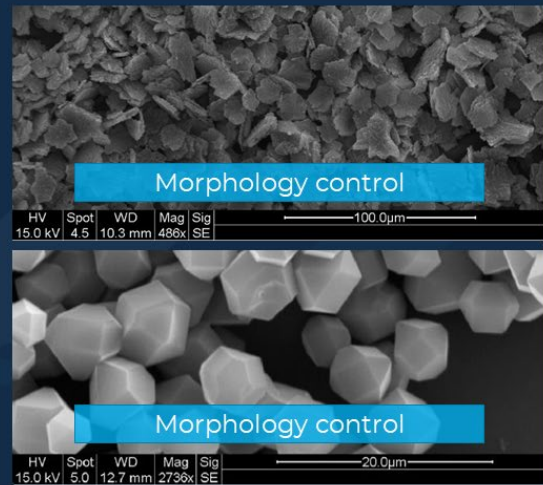
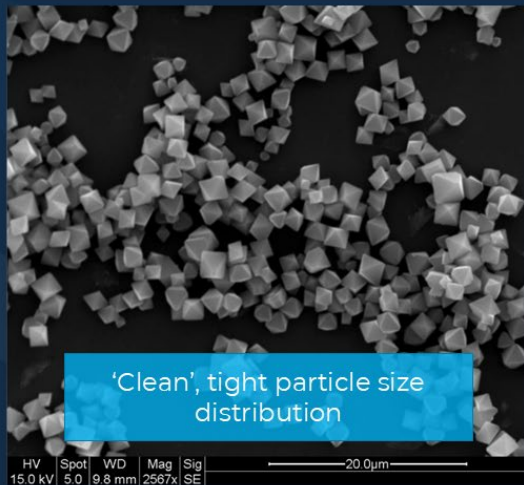
- Proprietary continuous flow manufacturing process
- Allows “in flight” optimisation of MOFs
- Superior MOF quality
 - “Not all MOFs are created equally”
- Patented reactor designs, new patent application(s), >15 years know-how IP

CONTINUOUS SYNTHESIS OVERCOMES THE HISTORIC CAPACITY AND COST ISSUES THAT HAVE HELD MOFs BACK

MOF 2024 – 18th July 2024, Singapore

4

High Quality



MOF 2024 – 18th July 2024, Singapore

5

Promethean's Mission

To unleash the **game-changing potential of MOFs** in the fight against climate change through our proprietary continuous-flow manufacturing processes



Determining Viability: Our Approach

- Approximately 100,000 different MOF chemistries reported to date
 - How do we select an optimal MOF(s) for a given application?
- Various considerations can be broadly grouped into 8 different *factors*
- These factors can be summarized under 4 **thematic pillars**
 - **Performance**
 - **Economics**
 - **Supply Chain**
 - **ESG**



Promethean Whitepaper (May 2023)
 Beyond CO₂ Capture: Determining the Industrial Viability of Metal-organic Frameworks (MOFs) for Carbon Capture and Storage (CCS) Applications



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Demonstrated Scale-Up



MOF 2024 – 18th July 2024, Singapore

8

Demonstrations of Scale

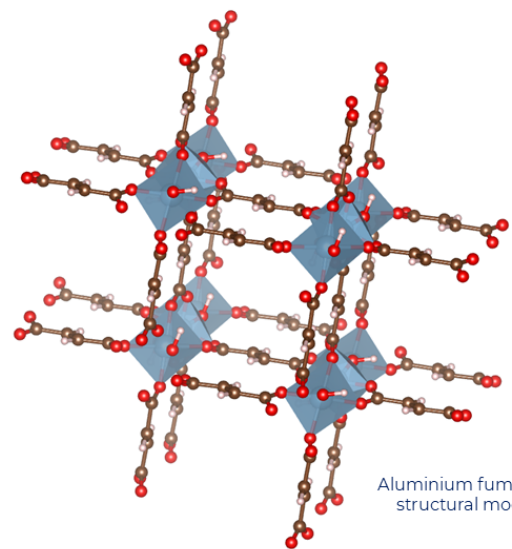
MOF 2024 – 18th July 2024, Singapore

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Case Study 1

Material: Aluminium fumarate

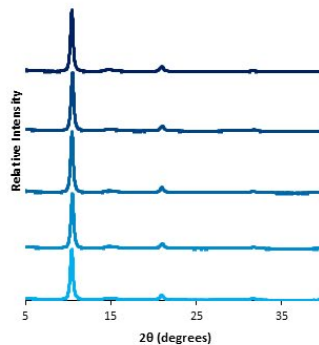
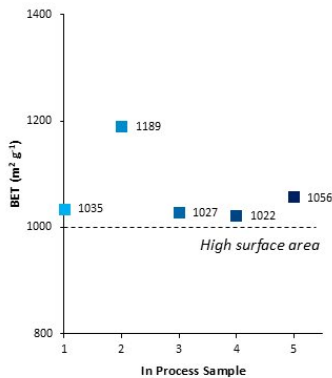
- ◉ **4-tonne commercial order**
- ◉ **Defined Structure**
 - Rigid structural analogue of MIL-53(Al)-BDC
 - Aluminium cation, fumaric acid linker
 - Hydrothermal synthesis reported
- ◉ **Key Properties**
 - Moisture stable and thermally resistant
 - Surface area >1,000 m² g⁻¹
- ◉ **Application Interest**
 - Water harvesting
 - Gas capture and storage



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Case Study 1: AlFu



**High Quality
& Consistent**



**Industrial
Scale**

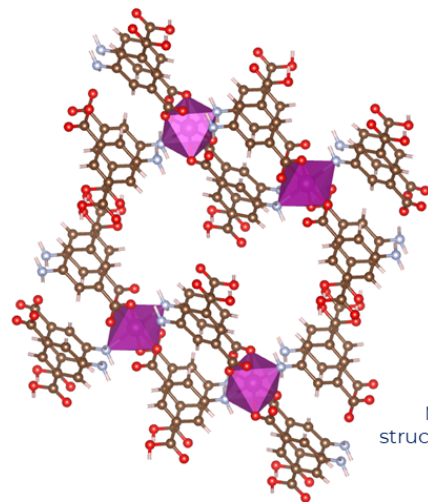
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Case Study 2

Material: MUF-16

- **Collaboration with MOF Inventor**
- **Defined Structure**
 - Range of cations (Co, Ni, Mn)
 - 5-aminoisophthalic acid linker
 - Solvent based synthesis route
- **Key Properties**
 - Thermally stable (beyond 330 °C)
 - Remains stable in the presence of steam
- **Application Interest**
 - Gas capture
 - Selectivity for CO₂ over hydrocarbons
 - Biogas upgrading



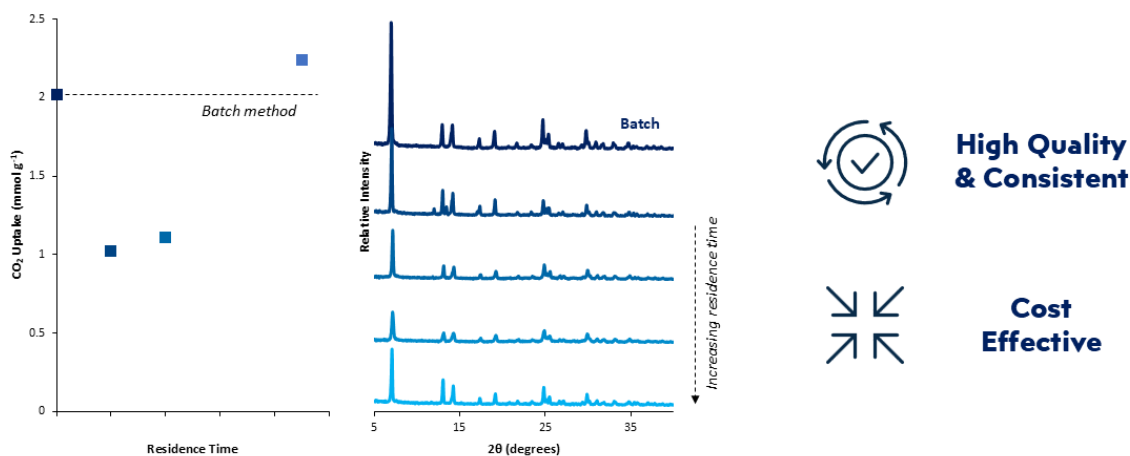
MUF-16 structural model

Qazvini, O.T., Babarao, R. & Telfer, S.G *Nat Commun* **12**, 197 (2021)

MOF 2024 – 18th July 2024, Singapore

12

Case Study 2: MUF-16



MOF 2024 – 18th July 2024, Singapore

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Summary

- Promethean's proprietary reactor technology enables **industrial scale, high quality, cost-effective** MOF production
- By taking a **holistic approach to MOF viability**, we're on a mission to unleash the performance of MOFs in industrial applications
 - This holistic approach ensures we **Mind the Gap** when evaluating viability
- We collaborate with MOF inventors to develop **scalable production methodologies** for novel MOFs
- We have already demonstrated **MOF production** at the **tonne-scale** through our synthetic approach

MOF 2024 – 18th July 2024, Singapore

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Thank You for Attending!

- Visit our exhibition booth **A02**
- Follow our LinkedIn page and website for more information and recruitment updates
- Download our white paper discussing the industrial viability of MOFs for CCS



Annex 5 - D6.5 Selina Ambrose MOF2024 Oral Presentation



Unleashing the Potential of MOFs for Next-generation Carbon Capture

James Stephenson, Chief Executive Officer
Selina Ambrose, Product Manager
Paul Kirkman, R&D Manager
18th July 2024

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Outline

- Introduction to Promethean Particles
 - Company Overview
 - Our business model and position in the value chain
- Application Development: MOF-based Carbon Capture and Storage (CCS)
 - Introducing existing CCS solutions
 - Why MOFs for CCS?
 - Why Promethean's MOFs for CCS?
- Concluding Summary
- Q&A

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2

Company Overview

- ◉ Promethean Particles is an industrial-scale manufacturer of high quality and cost-effective MOFs
- ◉ Focused on development of MOFs to aid the energy transition
 - Carbon capture
 - Water harvesting
 - Gas storage
- ◉ Existing patents & know-how on reactor designs and MOF processing at scale
- ◉ Ownership and operation of the world's largest manufacturing plant of its kind
- ◉ Based in Nottingham, UK with manufacturing and R&D facilities



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3

Promethean's Mission

To unleash the **game-changing potential of MOFs** in the fight against climate change through our proprietary continuous-flow manufacturing processes



Industrial Scale



High Quality



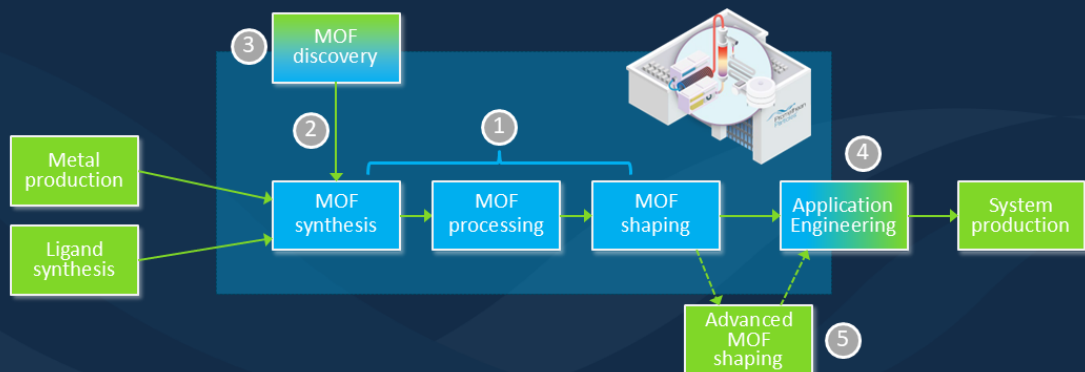
Cost Effective

Promethean's Proprietary Reactor Technology

MOF 2024 – 18th July 2024, Singapore

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Business Model/Value Chain



- ① Promethean's primary focus is on the scale manufacture of cost-effective MOFs
- ② Using the unique flexibility of Promethean's process to optimise MOF performance, cost and EHS profile (e.g., solvents)
- ③ Collaboration with MOF inventors offers a scale-up route to commercialise their IP
- ④ Promethean works with engineering companies to inform MOF-based system designs
- ⑤ Today, we haven't yet seen the need/value proposition for advanced shaping techniques

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5

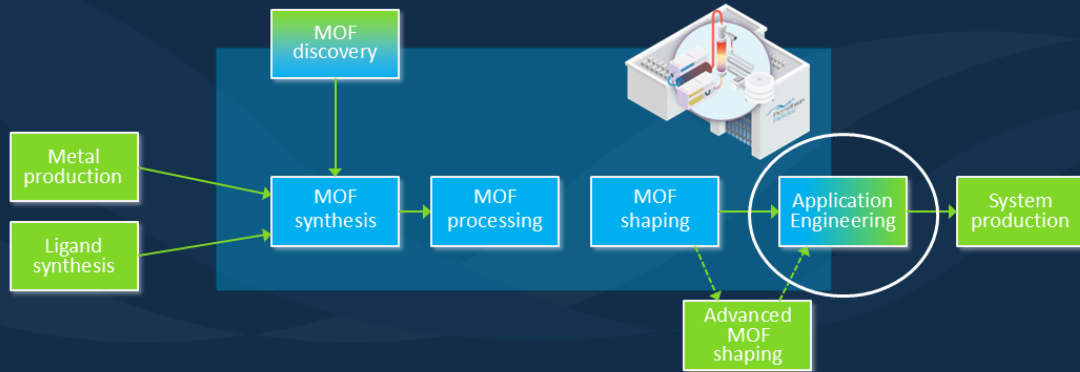
More on Promethean's MOF Production Later...

- Industry Forum session: Today at 16:15 Room 329
- Paul's talk will focus on Promethean's manufacturing capabilities and case studies of MOF scale-up and commercialisation

MOF 2024 – 18th July 2024, Singapore

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Business Model/Value Chain



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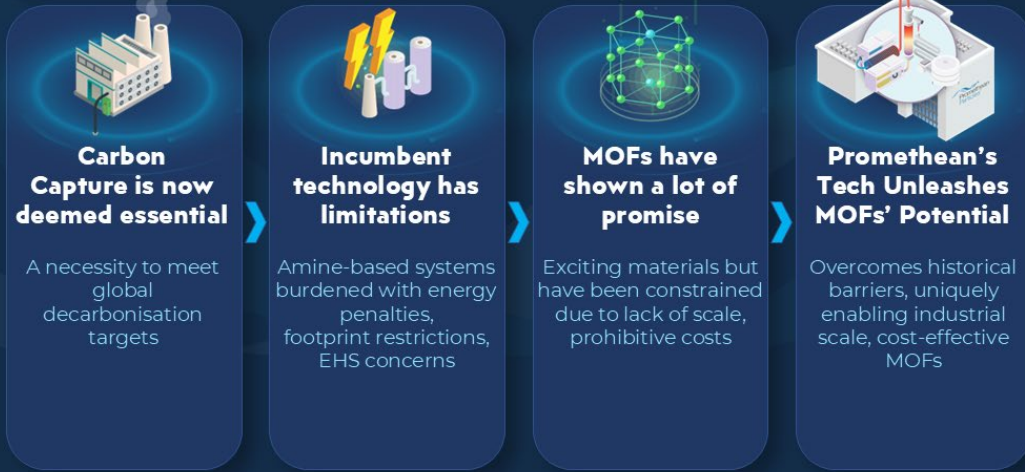
Application Development

Carbon Capture and Storage (CCS)

MOF 2024 – 18th July 2024, Singapore

8

Pioneering a Paradigm Shift in Carbon Capture



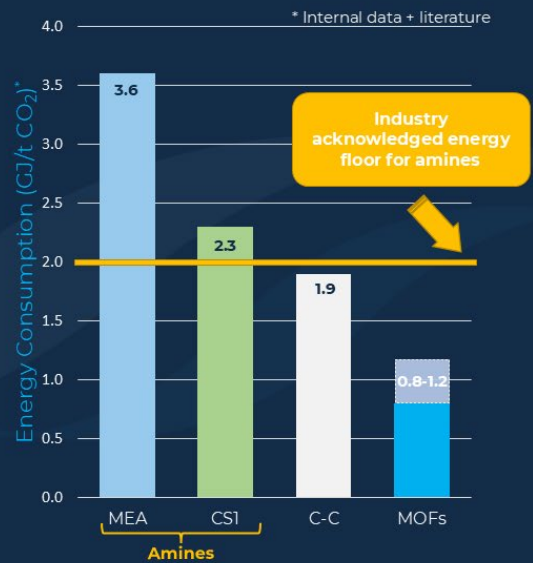
MOF 2024 – 18th July 2024, Singapore

9

Amine CCS Limitations

- 30-40% energy penalty
- Generate waste aerosols (NOx)
- Oxidation products highly corrosive
- >5% operating losses/month
- Reboiler/liquid condensers require a large footprint, high CAPEX

MOFs are starting out with a huge energy-efficiency advantage over incumbent and emerging technologies



MOF 2024 – 18th July 2024, Singapore

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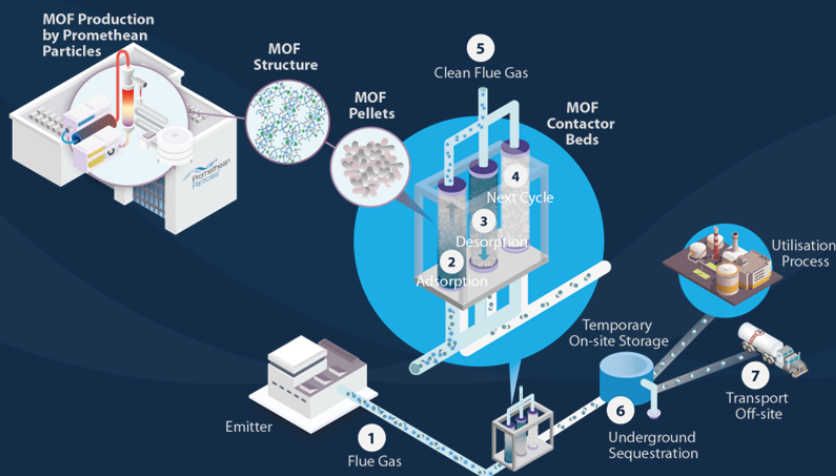
Why MOFs for CCS?

Hypothesis: MOF-based CCS is more viable than incumbent amines

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MOF-based Carbon Capture



- 1 Flue gas continually flows to the MOF-based CCS system
- 2 CO₂-rich flue gas enters a column of MOF pellets which capture the CO₂
- 3 Once saturated, a bed goes into a regeneration/desorption mode
- 4 After desorption, bed is ready for the next cycle
- 5 "Clean" flue gas stripped of CO₂ is released into the atmosphere
- 6 Stripped CO₂ is sent to temporary on-site compression & storage
- 7 CO₂ can then be transported off-site, further used, or sequestered

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Validating the Hypothesis

- ◉ Approached by an Oil & Gas Major to conduct a proof-of-concept **desktop feasibility study to compare MOF-based CCS vs. incumbent amine technology**
- ◉ Study based on flue gas parameters provided by the customer:
 - CO₂ Concentration: 25-30 mol%
 - Water content: >20 mol%
 - Flow rate: >2,000,000 kg/hr
- ◉ Promethean worked with an experienced engineering company in the O&G field to conduct the feasibility study, and calculate for both technologies:
 - CapEx & OpEx
 - Energy Penalty
 - CO₂ Capture Cost
- ◉ Models based on literature reports and lab test data obtained on Promethean's MOF products

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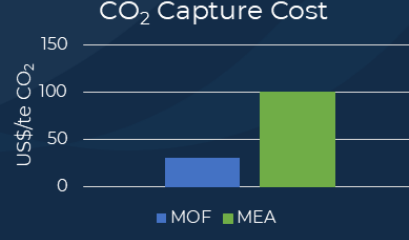
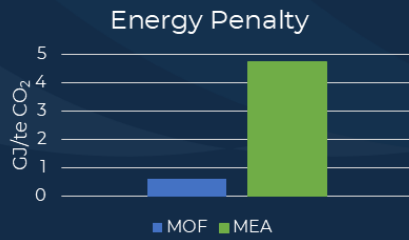
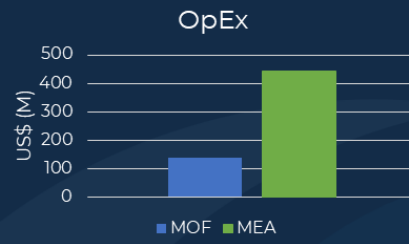
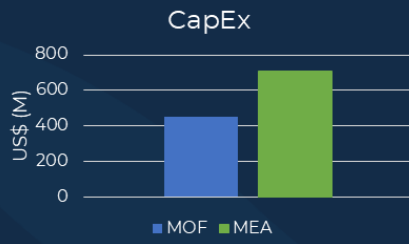
Feasibility Study – Assumptions

- ◉ Amines typically have a 90% capture rate compared to 95% for MOFs
- ◉ Monoethanolamine (MEA) used for comparison as the most studied amine
- ◉ MOF price (at the scale required for this study) = £30/kg
- ◉ 10-minute cycling time for CO₂ adsorption/desorption
- ◉ MOF can be cycled 100,000 times before replacement is necessary

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Feasibility Study – Key Findings



MOF-based CCS is **significantly lower cost** than the amine-based process in all aspects

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Demonstrating MOF-based CCS

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Key Developments

Data collection in progress
In progress, expected Sept 2024

	3	4	5	6	7
Technology Readiness Level	Proof-of-concept trials, component level	System validation in a laboratory environment	Sub-system validation in a relevant environment	Fully integrated pilot tested in a relevant environment	Sub-scale demonstration, fully functional prototype
MOF System Volume	20-30 mg	2-3 g	5 kg	10 kg	100 kg
CO₂ Capture (t/d)*			0.05	0.1-0.3	1-3
Timing			Dec 2022	June 2024	Q3 2024



* Cycling rate dependent

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TRL 7 : Project MONET

- MONET: “MOF-based Negative Emissions Technology”
- Carbon Capture demonstration project funded by the UK Government
 - Department for Energy Security and Net Zero
- Targeting a CO₂ capture rate of 1-3 tonnes per day
- Utilises ~100 kg of MOF
- Capability for automated vacuum swing operation



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Summary

- Promethean is a leading provider of industrial-scale, high-quality and cost-effective MOFs
 - Focus on MOFs for applications that tackle climate change
 - Promethean offer scale-up services to help MOF developers commercialise IP
- As MOFs are an emerging technology, application development is required to commercialise MOFs
- Application development:
 - Desktop study shows the significant cost and energy benefits of MOF-based CCS
 - >85% reduction in energy penalty and ~70 % reduction in CO₂ capture cost
 - MOF-based CCS demonstration projects underway using real-world flue gas
 - Project MONET will demonstrate a capture rate up to 3 te/day CO₂

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Thank You for Attending!

- Visit our exhibition booth **A02**
- Attend Paul's talk today in the industry forum
 - 16:15, Room 329
- Follow our LinkedIn page and website for more information and recruitment updates
- Download our white paper discussing the industrial viability of MOFs for CCS:



UNLOCK THE POTENTIAL OF YOUR MOF

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Presented by:
Dr. Paul Kirkman
R&D manager,
Promethean
Particles

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