

【Section 1】

NTU principle investigator	
Name (last name, first name)	Wu, Kevin C.-W.
Position	Professor
Faculty/Department	Department of Chemical Engineering

KU principle investigator	
Name (last name, first name)	Furukawa, Shuhei
Position	Professor
Faculty/Department	Institute for Integrated Cell-Material Sciences

Type(s) of funding applied
<input type="checkbox"/> Funding Type 1 (General Funding) only <input type="checkbox"/> Funding Type 2 (ECR Funding) only <input checked="" type="checkbox"/> Both Funding Type 1 (General Funding) and Type 2 (ECR Funding)

【Section 2】**Project title**

Development of porous liquids based on metal-organic polyhedra (MOPs)

Period of projectFrom dd/mm/yy
to dd/mm/yy

From 01/March/2023 to 27/Nov/2023

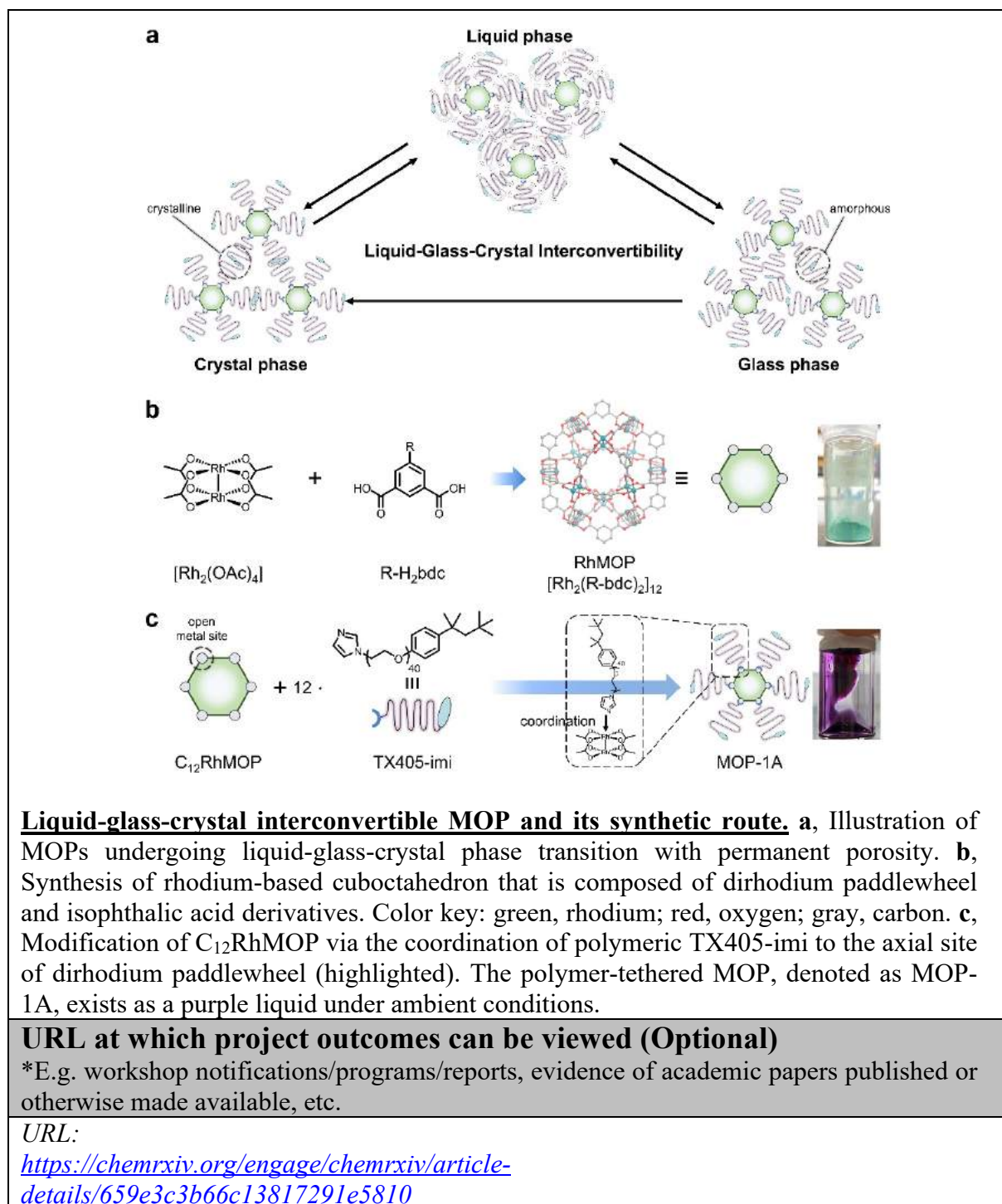
Summary of the project (approx. 100 words)

The ECRs were sent to KU to acquire knowledge of organic synthesis and to develop porous liquid materials from both PI at NTU and KU. Our collaboration resulted in the successful development of reversible phase transitions between liquid, glass, and crystal phases in metal-organic polyhedra (MOPs) through a modular synthetic approach. (as shown in the figure below.)

This innovation enables the fabrication of gas separation membranes with tunable permeability and selectivity. Notably, the liquid MOP membrane exhibits superior CO₂ selectivity over H₂, offering enhanced permeability compared to traditional porous membranes. These findings were submitted to *Nature Materials*.

Photographs with captions

*Please submit digital files (such as JPEG or GIF files) of the photographs used in your report as attachments. The size of each image should be at least 4MB, so that it can be used for printed materials. Please ensure that none of the photographs submitted will cause any issues relating to portrait rights.



【Section 3】

Visiting ECR*	
Name (last name, first name)	Po-Chun Han
Position	Ph.D. student
Faculty/Department	Ph.D. Program of Green Materials and Precision Devices
Period of Stay (From dd/mm/yy to dd/mm/yy)	From 2023/06/11 To 2023/06/20

Host researcher*	
Name (last name, first name)	
Position	
Faculty/Department	

*Please complete if the host researcher is different from the KU principal investigator.

Achievements and outcomes of ECR stay (approx. 100–250 words)
<p>To summarize my newfound knowledge and accomplishments during my visit, I have compiled a few takeaways below:</p> <ol style="list-style-type: none"> 1. I have acquired techniques for organic synthesis and characterization, including column chromatography, diffusion-ordered spectroscopy nuclear magnetic resonance (DOSY-NMR). 2. Learning how to summarizing the experimental data into a clear and brief weekly report for discussion. 3. Learning how to write a scientific article logically with clear illustrations and precise descriptions. 4. Starting new research and finalizing it by collaborating with members from various countries and teams. The research has been submitted to <i>Nature Materials</i> on Apr. 2024.

Photographs with captions
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URL at which project outcomes can be viewed (Optional)

*E.g. workshop notifications/programs/reports, evidence of academic papers published or otherwise made available, etc.

URL:

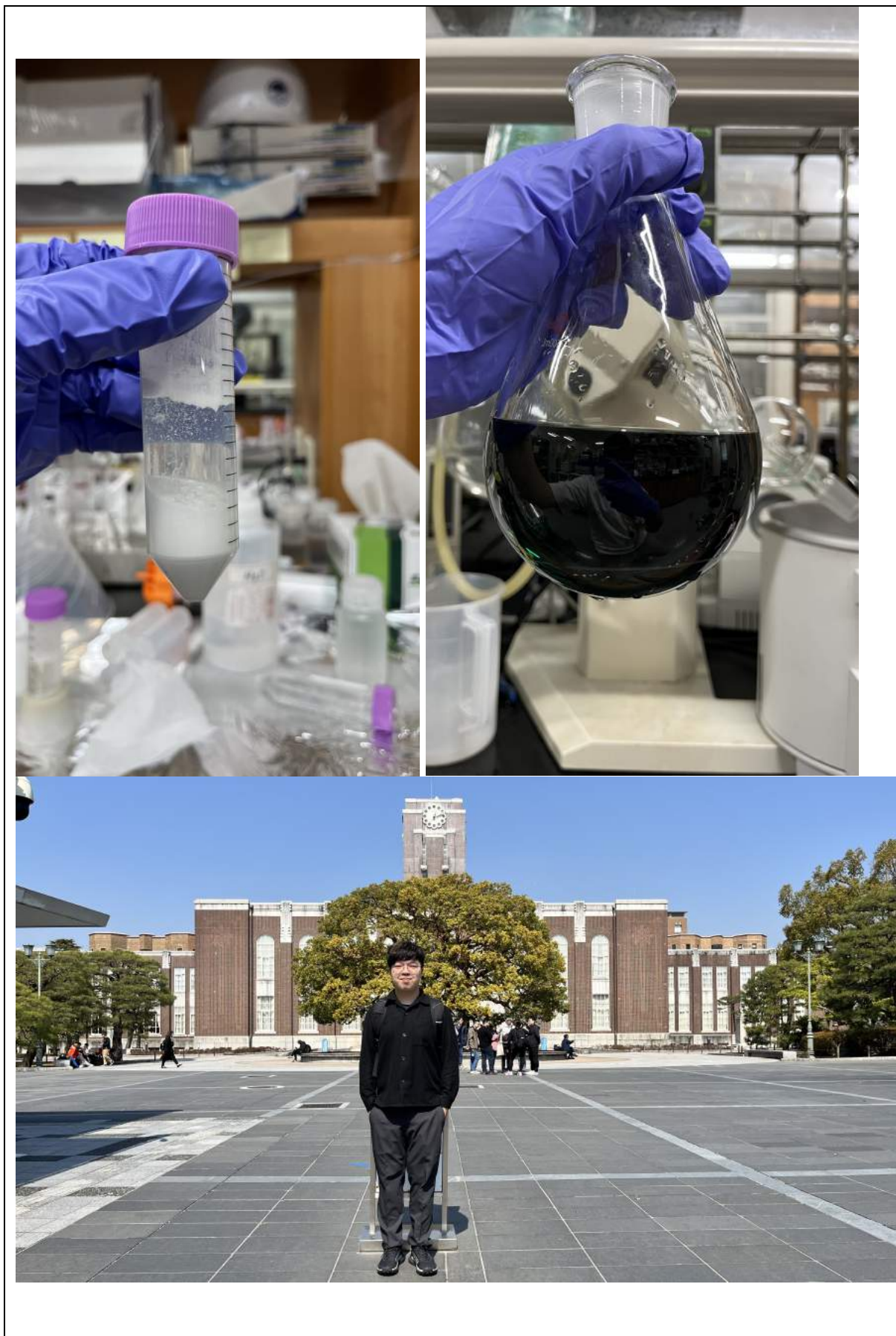
Visiting ECR*	
Name (last name, first name)	Chu-Ren Chen
Position	Ph.D. student
Faculty/Department	International Graduate Program of Molecular Science and Technology
Period of Stay (From dd/mm/yy to dd/mm/yy)	From 2023/07/11 To 2023/07/20

Host researcher*	
Name (last name, first name)	
Position	
Faculty/Department	

*Please complete if the host researcher is different from the KU principal investigator.

Achievements and outcomes of ECR stay (approx. 100–250 words)
<p>During my stay at Kyoto University, I can summarize the achievements and outcomes in below:</p> <ol style="list-style-type: none"> 1. Learn the brief concept of porous material and the way to characterize the synthesized material. 2. Learned how to synthesize porous material and learn the procedure and concept to purify the sample, such as the use of the rotary evaporator and centrifuge. 3. Learn how to summarize the data and discuss with the teacher and labmates to improve and modify the experiment. 4. Learn to draw the schematic illustration to express the experiment target and concept.

Photographs with captions
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URL at which project outcomes can be viewed (Optional)

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URL:

***If there are multiple ECRs, please copy and paste this section and complete them for each ECR.**