

Exploring Isostructural Metal-Organic Frameworks with Biosourced Linkers for Enhanced Hydrogen Sorption



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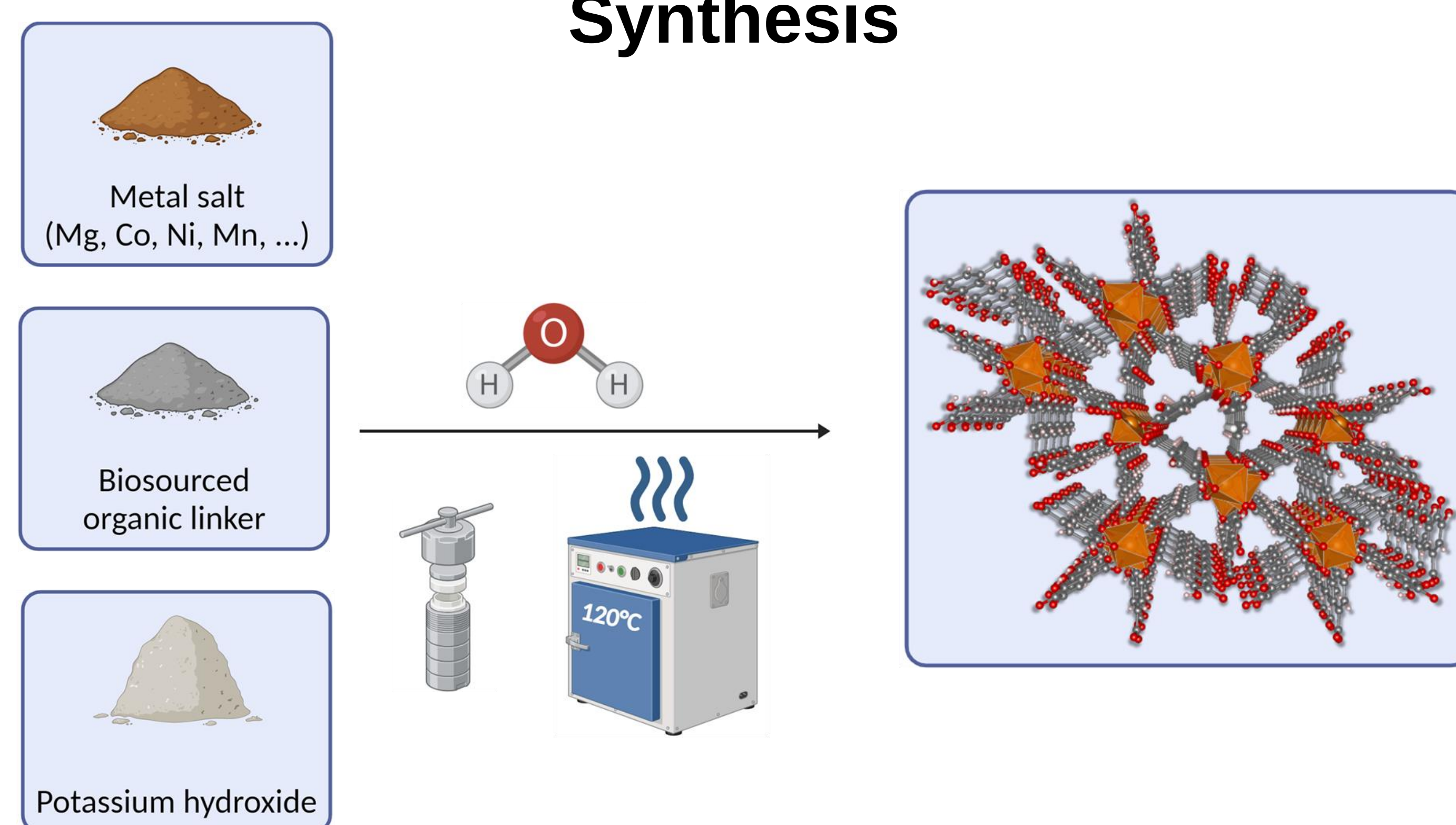
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Introduction

In this work, we focus on the exploration of various isostructural MOFs based on a biosourced linker. This promising series of sustainable MOFs offers ultra microporosity, which can efficiently interact with hydrogen. The variation of metal centres by substitution in a unique framework (i.e. Mg, Mn, Ni, Co, etc.) enables us to understand the impact of the metal on the hydrogen sorption capabilities.

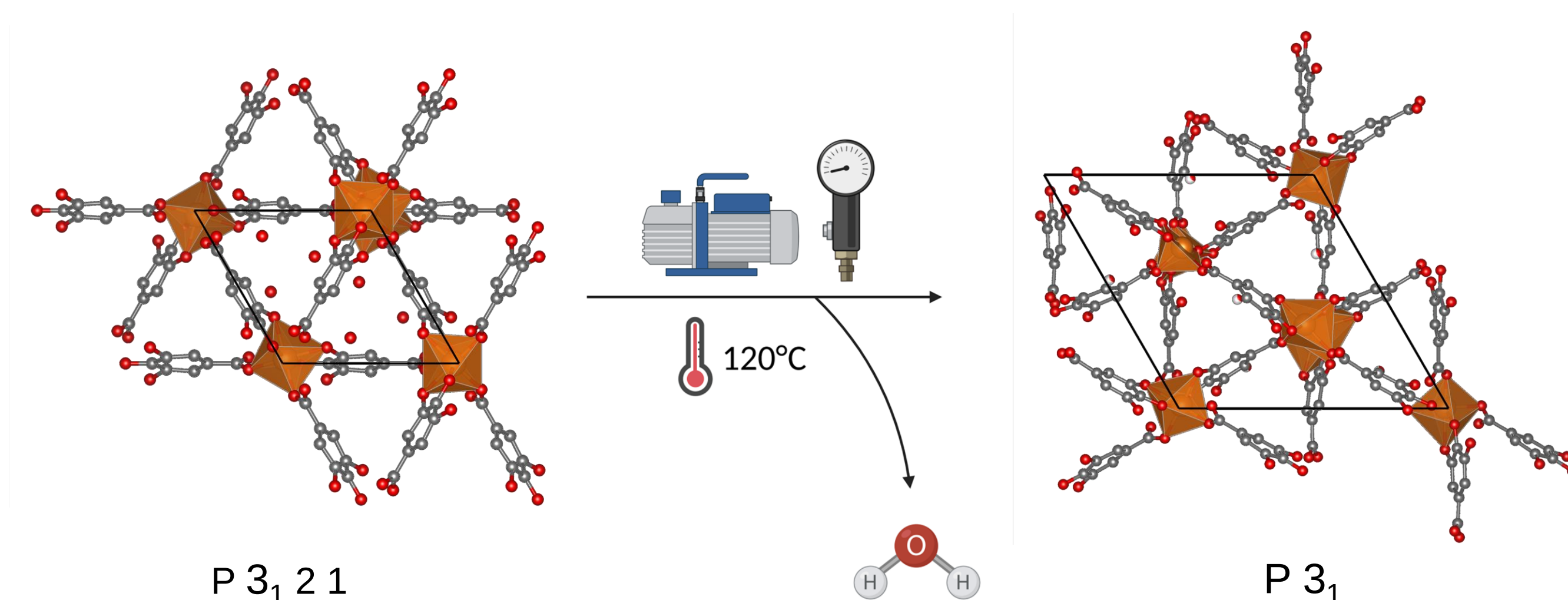


Synthesis

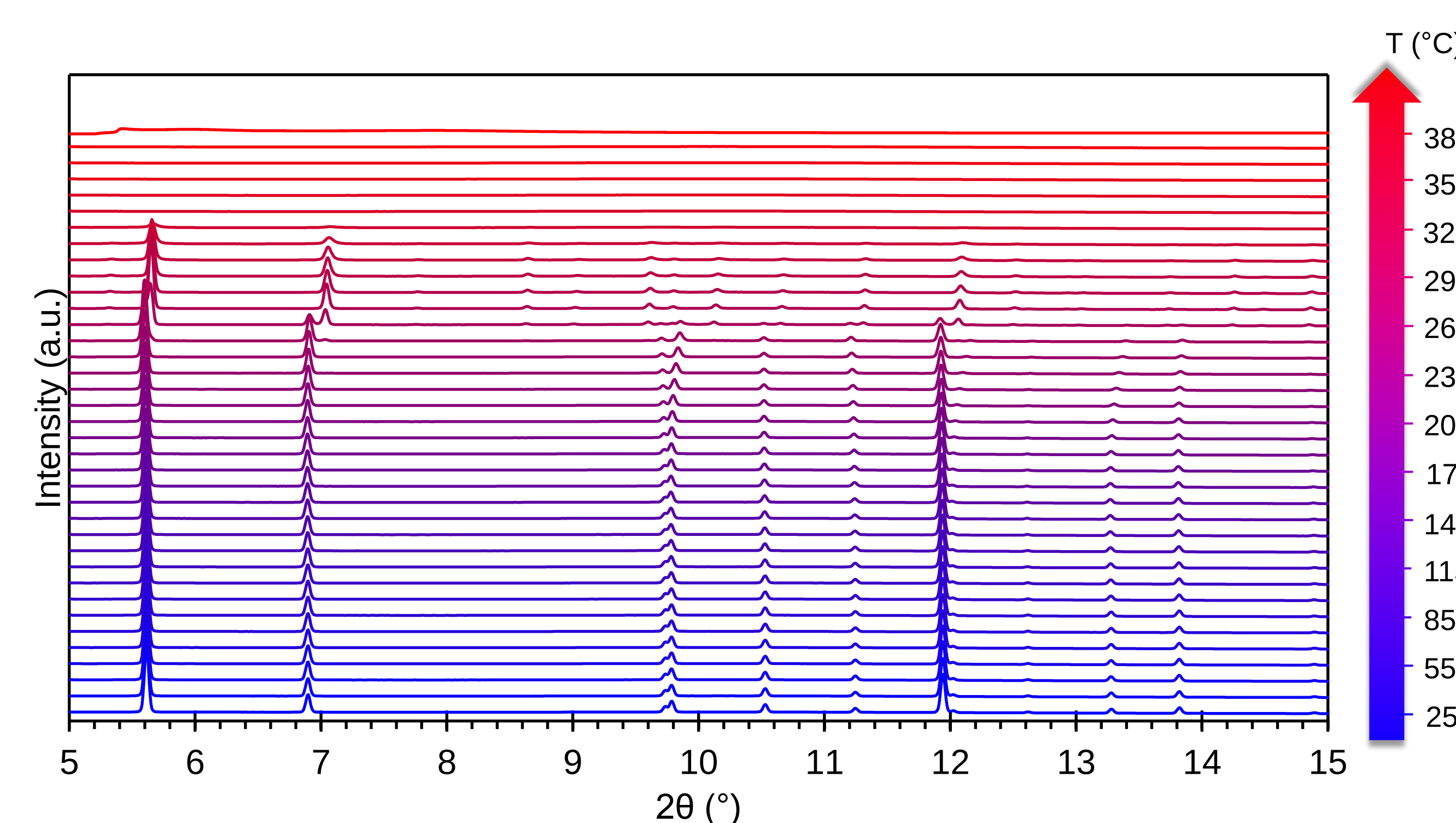


A case study: Mg-based MOF

Organic linker rotation & space group change

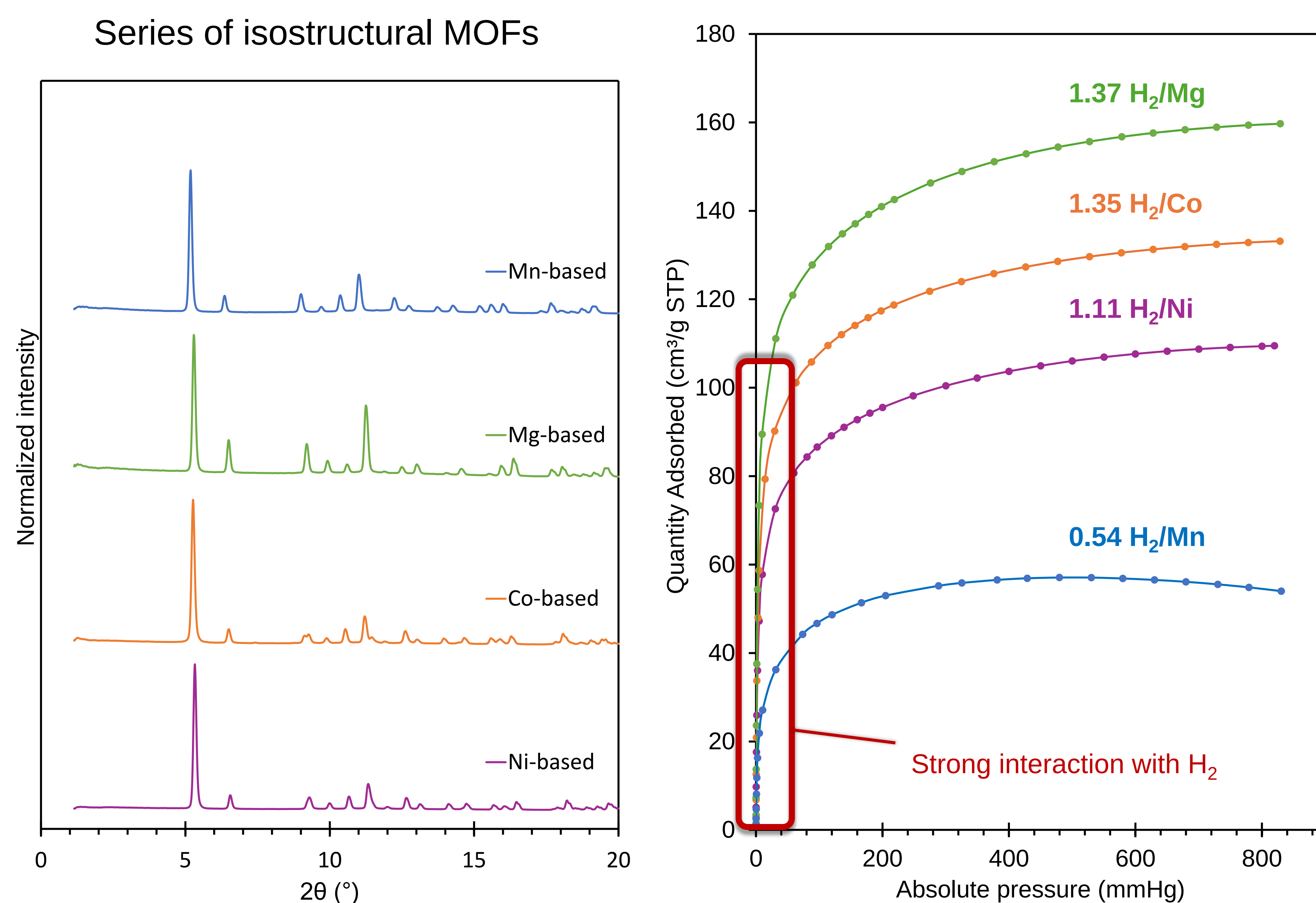


In situ variable temperature synchrotron PXRD
⇒ Phase transition @ 270°C



Influence of metal centres

Series of isostructural MOFs



Conclusions

- Activation with structural transition
- Activated MOFs show a strong affinity for H₂
- Adsorption capacity depends on the metal center

Perspectives

- Studying the mechanism of hydrogen adsorption by neutron diffraction
- Study sorption of other gases → explore additional applications for these MOFs

Acknowledgement

