Postdoctoral position (12 months, renewable)

# « Synthesis of porphyrin derivatives for the elaboration of MOF-based $CO_2$ reduction photocatalysts»

**Keywords:** Porphyrins, organic chemistry, coordination chemistry, $CO_2$ photocatalytic reduction

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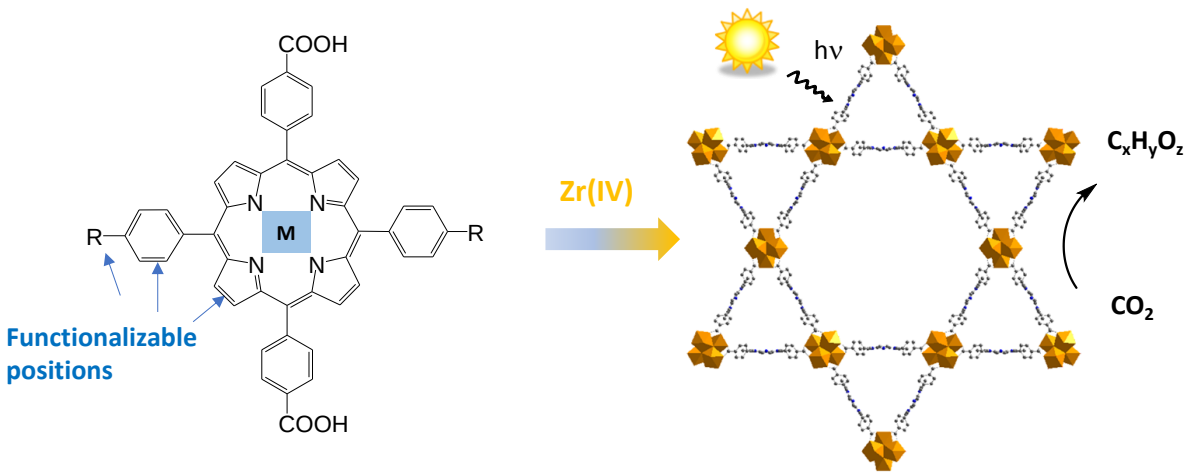
**Starting date :** November-December 2022

In the context of the $CO_2$ valorization, the project aims at synthesizing porphyrin organic linkers for the elaboration of metal-organic frameworks (MOFs) exhibiting high photocatalytic activities for $CO_2$ reduction under visible light illumination. We will consider the Zr(IV) porphyrinic MOF-545 as a versatile platform to elaborate new functionalized photocatalysts. We recently proposed a mechanism for the photocatalytic reduction of $CO_2$ into formate (Y. Benseghir et al. *J. Mater. Chem. A*, 2022, 18103-18115). The present project will further explore different strategies to enhance the $CO_2$ reduction photocatalytic activity by playing both with the porphyrinic linkers and the photocatalytic conditions. The synthesis of the porphyrin linkers and the photocatalytic experiments will be performed at ICMMO (Orsay); the synthesis and the characterization of the MOF materials will be effectuated at ILV (Versailles), both laboratories belonging to University Paris-Saclay. When required, DFT calculations will be performed at the Collège de France (Paris) by C. Mellot-Draznieks.




Candidates must have experience in organic synthesis, in the synthesis of hybrid organic-inorganic compounds and in the usual characterization methods of organic molecules (NMR, mass spectrometry …). An experience in materials chemistry and photocatalytic experiments will also be appreciated. They should submit their application to Anne Dolbecq (ILV, anne.dolbecq@uvsq.fr) and Zakaria Halime (ICMMO, zakaria.halime@universite-paris-saclay.fr). It must include a CV, a minimum of two letters of references and a cover letter.