

## Post-doctoral Research Position: Synthesis of New Photosensitizers for CO<sub>2</sub> Photoreduction and Carbonylation Reactions

**Employer:** Université de Lorraine, Metz, France

**Contract Type:** Temporary, 12 months (renewable)

**Workplace:** Laboratoire Lorrain de Chimie Moléculaire (L2CM), UMR 7053, Metz, France

**Start Date:** September 2024

**Contact:** Pr. Ibrahim Abdellah ([Ibrahim.abdellah@univ-lorraine.fr](mailto:Ibrahim.abdellah@univ-lorraine.fr))

### Project Overview:

The project focuses on the development of new photosensitizers and catalysts, based on purely organic materials or more abundant metals, for the photoreduction of CO<sub>2</sub> to CO. This research, conducted in collaboration with other groups, aims to investigate the catalytic cycle of these new photosensitizers and catalysts, providing insights into the structure-function relationships of these molecular architectures. The ultimate goal is to design more efficient photocatalysts through a rational approach.

Key techniques involved in the project include electrochemistry and electronic and vibrational spectroscopy to identify key intermediate species formed during the catalytic cycle. The performance of new catalysts will be evaluated under photocatalytic conditions, focusing on turnover frequency (TOF), turnover number (TON), and selectivity. The CO produced through photoreduction can be utilized in various carbonylation reactions facilitated by catalysis or photocatalysis.

### Candidate Profile:

- **Education:** Ph.D. in Organic Chemistry, Organometallic Chemistry, or Catalysis.
- **Skills:**
  - Knowledge of vibrational spectroscopy and electrochemistry is highly desirable.
  - Ability to work independently with minimal supervision.
  - Strong teamwork and communication skills for interdisciplinary collaboration.
- **Language Proficiency:** Fluency in English, both written and spoken, is essential.