



Université de Paris

Laboratoire d'Electrochimie  
Moléculaire



**POSTDOCTORAL POSITION**  
*available early 2020*

**Design of a photochemical reactor at the lab scale  
for the molecular catalysis of the reduction of CO<sub>2</sub>.**

In the last years, the reduction of carbon dioxide into useful organic compounds and fuels has become a major and intense research field. One route to this goal consists in first converting sunlight energy into electricity than could be further used to reduce CO<sub>2</sub> electrochemically. Another approach is to directly use the visible photons from sunlight and to drive the reduction of the gas into “solar fuels”, leading to solar energy into chemical bonds.

Our group has shown that iron porphyrins are currently the most efficient molecular catalysts for the CO<sub>2</sub> to CO reduction in aprotic solvent as well as in water (*Science* 2012, 338, 90; *JACS* 2016, 138, 16639) but these compounds even proved to be the first molecular catalysts able to reduce CO<sub>2</sub> into CH<sub>4</sub> upon visible light irradiation (*Nature* 2017, 548, 74; *JACS* 2018, 140, 17830).

In this context, we have set a research consortium called MARS (Renewable Solar MethAne) with the French gas distribution companies (GRDF, GRTgaz and Téréga). One major goal of this research project is to build a photochemical cell prototype at the lab scale.

In parallel to the mechanistic investigations currently done in the group by combining electrochemistry, photochemistry and spectroscopy, as well as theoretical calculations, the PDRA, in strong interaction with the experimentalists in the group, will be in charge of the design and the development of a photochemical cell prototype and evaluation of its performances (light absorption efficiency, selectivity and rate, stability, etc.).

**Candidate profile:**

The candidate must hold a doctoral degree in chemistry or chemical engineering. She/he should be familiar with molecular chemistry and be skilled in the design of cells at the lab scale. The candidate should be highly motivated for interacting with experimentalists and industrial partners. English is mandatory.

The position is for 12 months (with possible extension).

**Contact:** REACTE team

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