

Postdoc Position (24 months)

“Hybrid Colloidal NanoParticles for Photocatalysis”

Position Description: The Bio-inspired Materials BIM group of the IPREM Institute (UMR 5254 CNRS and University of Pau & Adour), is looking for a very good, highly motivated candidate for a postdoc position opening in July 2024. The BIM group has recently worked on the conjugation between molecular organo-metallic catalysts and synthetic functional macromolecules to develop Artificial MetalloEnzymes AMEs for H₂ evolution, as single polymeric nano-particles.¹ The BIM group also worked on heterogenization of molecular organo-metallic catalysts for CO₂ reduction.² Herein the ENSUITE project, we want to develop Hybrid Colloidal NanoParticles for H₂ evolution and CO₂ reduction by photocatalysis.

Location: IPREM (Pau in South-Western of France).

Missions: The candidate will take a leading role in the synthesis of both, carbonaceous based hybrid colloid nanoparticles³ and metallic nanoparticles. The final colloids will be used in photocatalytic conditions for H₂ evolution and CO₂ reduction.

Main responsibilities:

- Synthesis of polymeric NPs by precipitation
- Synthesis of metallic colloidal NPs by salt reduction
- Physico-chemical colloidal characterization
- Hybrid NPs synthesis and characterization
- Photochemical activity for H₂ production and CO₂ reduction
- C1/C2 products detection by *in situ* GC/MS

Qualifications: Prospective candidates should have a

- Strong background in Polymer science (PhD), specifically on their physical chemistry properties and colloidal state,
- Expertise in macromolecular self-assembly is also desirable,
- Preliminary experiences in (photo)electrocatalytic reactions for H₂ evolution and/or CO₂ reduction will be a plus,
- Proficient in spoken and written English. Strong written and verbal communication skills are required for this position, especially in the context of a highly multidisciplinary topic within the collaborative ENSUITE project.

¹ A. Zamader *et al.*, *Chem. Eur. J.* 2022, , e202202260; *ACS Catalysis*, 2023, 13, 1246–1256 ; *Sustainable Energy & Fuels*, 2023, 7, 4967-4976.

² D. Grammatico *et al.*, *ChemSusChem*, 2020, 13, 6418-6425; *Angewandte Chemie*, 2022, 61, e2022063; *ChemComm*, 2023, 59, 2279-2282.

³ A. Holmes *et al.*, *ACS Nano*, 2021 15, 3927-3959 ; *Current Opinion in Colloid and Interface Science*, 2021, 56, 101511; *Materials Today Chemistry*, 2022, 26, 101229

Risks : Contact with halogenated solvents for NMR analysis

Public information : For information on the project and position, interested candidates are encouraged to contact Pr. Laurent BILLON, leader of the Bio-inspired Materials group BIMG: Functionality & Self-assembly, by email at laurent.billon@univ-pau.fr.

(https://iprem.univ-pau.fr/fr/_plugins/mypage/mypage/content/billon.html)

Please include a CV, brief description of research interests, and contact information for at least one professional reference.

The postdoc position is available for a twenty-four months postdoctoral fellowship (24 months) with a gross salary of ca. 3 100€/month, with a starting date on July 2024.