POST-DOCTORAL POSITION (12 MONTHS)

Laboratoire Lorrain de Chimie Moléculaire

CNRS / Université de Lorraine NANCY

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Development of innovative catalysts based on graphene quantum dots and transition metals

Keywords: nanomaterials, graphene quantum dots, coordination chemistry, catalysis, transition metals.

Subject

Graphene quantum dots (GQDs) are nanometer-sized fragments of graphene that exhibit unique electronic, optical, and chemical properties due to their small size and high surface-to-volume ratio. Owing to their unique features, GQDs are holding great promise for various applications ranging from energy to environment and biology. GQDs could be synthesized either by conventional stepwise organic synthesis or, more rapidly, by either top-down or bottom-up one step approaches from various chemicals. In that context, we recently developed a valuable synthetic route allowing to prepare GQDs at the gram scale from non-food biomass wastes following a rapid and efficient process that has been recently patented.

This project will be devoted to the development of new sustainable catalysts synthesized by combining graphene quantum dots and first row transition metals through coordination. This project involves three main goals:

- Development of the optimized synthetic process allowing to prepare composites of GQDs and transition metals.
- Full characterization of the composites by IR, XRF, XPS, HR-TEM, SEM, DLS, EDS, UV-vis and photoluminescence.
- Evaluation of their catalytic properties.

This postodoctoral position funded by Université de Lorraine and CNRS provide an excellent framework for research in material science and sustainable organic chemistry.

Candidate profile and skills

- Doctor in Chemistry with a strong background in material science and ideally with experiences in the synthesis and characterization of carbon-based nanomaterials.
- Good knowledge of English and scientific communication skills, oral and written skills.
- Sense of thoroughness, organization and initiative; capacity of synthesis; reactivity and autonomy.

Application

Candidates must submit their applications including a detailed Curriculum Vitae, a motivation letter, copies of degree certificate and the contact of at least two references to Dr. Philippe PIERRAT (philippe.pierrat@univ-lorraine.fr).
Application deadline: 21/02/2025
Expected starting date: March - April 2025