Do you want to synthesize hydrogen by plasma? You have a background in plasma chemistry, plasma physics, or plasma technology?

ChemSIN is looking for one post-doctoral researcher, and one PhD student (shared with UGent) to work on the PLASyntH2 project granted in the framework of the Belgian Excellence of Science (EOS) program of FWO-FNRS.

**PLASyntH2: Plasma-based green hydrogen synthesis from hydrocarbons**

**Project description**

Plasma-based H₂ synthesis from hydrocarbons is an interesting complementary approach to water electrolysis, because it also uses renewable electricity and has no CO₂ emission, and in addition, it can valorize CH₄ and plastic waste, generate high value C-materials as side-product, and is thermodynamically more favorable. However, before exploiting this application, it is crucial to gain a better fundamental understanding of the plasma processes.

This is exactly addressed in our project. We will perform green H₂ synthesis experiments from various hydrocarbons and in several plasma types, in gas-phase and in contact with liquids, and develop a multi-diagnostics platform for time- and spatially-resolved characterization, as well as novel multi-dimensional, multi-scale models, to study the underlying mechanisms in all plasma systems. We will start with simple molecules, i.e., CH₄ (gas-phase) and (m)ethanol (liquid-phase), and subsequently develop our methodologies to study H₂ synthesis from alkenes (C3-C5 and higher) and styrene, as model systems for (both gas-phase and liquid-phase) pyrolysis products of plastic waste. Besides determining the H₂ yield and energy consumption for all systems, and the detailed plasma diagnostics and modelling, we will also characterize the synthesized C, and target the latter as extra value-added product. The project outcomes will lay the basis for green H₂ synthesis by plasma technology and will open up a new area in the field of plastic waste recycling.

**Consortium**

PLASyntH2 is a collaboration between the following PI’s and universities in Belgium:

- **BOGAERTS Annemie**, Coordinator – University of Antwerp (www.uantwerpen.be/plasmant)
- **DE GEYTER Nathalie** – Ghent University (www.ugent.be/ea/appliedphysics/en)
- **MORENT Rino** – Ghent University (www.ugent.be/ea/appliedphysics/en)
- **RENIERS François** – Université Libre de Bruxelles (http://chemsin.ulb.be/)
- **SNYDERS Rony** – University of Mons (https://chips.umons.ac.be/index.php/fr/)

**Profile of envisaged PhD students**

- You should have a master degree in one of the following fields: chemistry, physics, physical chemistry, material science, engineering physics, chemical engineering, material engineering, or equivalent.
- Candidates recently graduated are also encouraged to apply.
- You should have excellent qualifications at bachelor and master levels.
- You should have an independent and well-organized working style, demanding a high standard for your own work.
- You should have well-developed social skills directed towards working in an interdisciplinary team as well as excellent interpersonal and communicative skills.
You should have very good to excellent English language skills (verbally and written).

**We offer to the PhD student**

- A full-time (100%) PhD student position as a bursary. The scholarship is initially offered for a period of one year and will be renewed up-to four years upon positive evaluation.
- A competitive salary for doctoral students.
- A challenging, versatile and carefully designed project.
- A dynamic, multi-disciplinary and ambitious research consortium with a wide international network.
- Full access to expertise, state-of-the-art research infrastructure and user training.
- Access to a Doctoral Training Program.
- An opportunity to earn the highest academic degree.
- Envisaged starting date: as soon as possible.
- The PhD students will work partly in ULB and partly in UGent, co-supervised by 2 PI’s, and will obtain a joint or double PhD diploma.

**Profile of the post-doctoral fellow**

- You should have a PhD diploma or should be expecting to obtain a PhD in the near future in the field of plasma physics, plasma chemistry or plasma technology.
- Specific experience in either atmospheric plasma technology, plasma engineering, plasma diagnostics, plasma chemistry is mandatory.
- You should show an excellent track record of publications in one of these requested research fields.
- You are a team player, you have a strong personality and you work in a result-oriented manner.
- You are creative and willing to work in a multidisciplinary context.
- You are proficient in oral and written English and have strong communication skills.

**We offer to the postdoctoral fellow:**

- A full-time position, initially offered for one year, but it could be renewed up to maximum four years upon positive evaluation.
- You will be directly embedded in a research consortium composed of plasma-oriented international research teams of different Belgian universities.
- You will have access to state-of-the-art tools and facilities, a rich training environment and the possibility to collaborate with many other groups within excellence-based universities.
- Envisaged starting date: as soon as possible.

**How to apply:**

Applications must contain the following documents in English:

- Personal (motivation) letter
- Curriculum vitae (an official proof of English language skills is an added value)
- List of publications (if available)
- Transcripts of B.Sc. and M.Sc. courses and grades
- Copy of your diplomas (if already available)

The requested documents should be sent to Prof. François Reniers (Francois.Reniers@ulb.be) entering as subject of your mail: PLASyntH2_your name. Starting date: as soon as possible.