

Interview with David FARRUSSENG *Researcher*



Dr. David FARRUSSENG has been working at CNRS (IRCELYON) in Lyon, France, as a permanent researcher since 2000. He is a co-leader of the Engineering and Process Intensification group, along with Dr. Yves SCHUURMAN. The group focuses on the joint development of nano-catalyst formulation and their applications into advanced chemical processes, such as micro reactors and membrane reactors for Sustainable Chemistry and Energy production. David carried out his PhD at The European Membrane Institute (IEM) in Montpellier, under the co-supervision of Drs. Anne JULBE and Christian GUIZARD and developed new porous catalytic membranes and new membrane reactor concepts for light alkanes valorization. At IRCELYON, he developed a dense catalytic membrane reactor for ethane oxi-dehydrogenation, which displayed unprecedented performances. David has been in charge of the institute's high throughput platform for catalyst screening for 10 years. He has also recently developed synthetic methods to tailor and shape Metal-Organic Frameworks.

What made you opt for a career as a researcher?

How would you define your job?

The freedom required for innovation has certainly been a strong incentive. To give you an idea of my job, I'll choose the word "exciting": it is indeed so exciting to see your ideas come true in a concrete and pragmatic "It's working!" way. Exchanging ideas with colleagues is also very stimulating. We are lucky enough in Europe to be able to talk freely to outstanding researchers.

We'd like to catch a glimpse of your daily activities. What is an average day for you?

Early in the morning, I work at home to finalize documents (publications, proposals, reviewing). Then once at the lab, I go to see students and technicians to learn about the most recent results in order to advise the students for their future experiments. Afternoons are usually dedicated to meetings to monitor the progress of research programs and to design new projects.

The gist of catalysis is accelerating chemical reactions, which can be viewed as something great from an environment-friendly perspective. Your Institute, IRCE, has revamped its name by adding an "E" standing for "environment" and one of your research group's main themes is "catalytic processes for sustainable chemistry". Would you say the field of chemistry is going through major changes?

E stands for "environment" and this one word encompasses two different notions. Firstly, it stands for cleanup or pollution control. At IRCELYON, we are developing new catalysts and processes for the abatement of toxic gases in the air or for water purification. In a recent past, a lot of effort was put into developing nanocatalysts for car exhausts. More recently, our group has addressed the issue of CO₂ capture (responsible for global warming) using efficient separation processes such as inorganic and hybrid membranes. ... /...

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.../... Nevertheless, there is now a paradigm change in the energy field, hence the second notion. We now prefer to focus on alternative processes to reduce pollution: they are more energy-efficient and sustainable while giving cleaner energy resources for the long-term future.

The CARENA project has been designed with a strong emphasis on multidisciplinary. What progress can be expected if chemists work in closer relation with other disciplines?

CARENA addresses this paradigm shift: How can we substitute declining oil resources for alternative resources? This a real S&T challenge... And only a multidisciplinary approach can tackle this challenge. All easy solutions have already been proposed, but none of them are reliable at the European level.

Contract research is a fast-growing phenomenon in France. The IRCE group you are co-leader of relies a lot on such contracts. What are the challenges involved with this type of contracts?

Catalysis is intrinsically an applied science. Researchers are frequently asked to develop more active and more selective catalysts... economical profits being the target. However, catalysis is also a mature science, and we usually hit the frontiers of knowledge so that step changes and breakthrough discoveries are unlikely. Hence, fundamental research is required to pave the ground for the next generations of catalysts.

What is the added-value of an EU project such as CARENA compared with other partnerships on the same topic you may be involved in?

The added-value of the project stands in the difference you have between the national and the international levels! Such a consortium which brings together world class experts in many different fields would not be possible to gather at a national level.

The CARENA project brings together Research labs, SMEs and industry. How do you view research-industry collaboration within the framework of the project?

What we have with such a consortium is a real value chain... which is a real opportunity to accelerate the development of the discoveries made at lab scale.

Thank you very much David, and all the best for CARENA and the other projects you are involved in.

CARENA in brief

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