CARENA

CAtalytic membrane REactors based on New mAterials for C1-C4 valorization

CARENA is a large-scale integrating project funded by the EC

Interview with Martin Drobek – CNRS-IEM, France.

I am a junior research scientist at the Institut Européen des Membranes (CNRS-IEM) in Montpellier, where I am involved in a large range of research activities typically targeting the development of membrane materials for the separation and treatment of liquids, vapors and gases. Originally I am coming from the Czech Republic and I was awarded PhD degree in 2008 at the Institute of Chemical Technology in Prague. Just after my PhD defense I obtained a post-doctoral position at CNRS-IEM where I worked contractually for nearly 5 years. In October 2013 I was recruited as permanent CNRS researcher with a fixed position at IEM in a research cluster focusing on preparation of ceramic and hybrid membranes by sol-gel and solution chemistry. Due to my long lasting experience in the field of material science, I obtained a post-doctoral position in CARENA research team in 2012 under the supervision of Dr. Anne Julbe and thanks to my new permanent post at IEM I continue my research activity in the project up to now.

What is appealing to you being a researcher? How would you define your job?

Being a researcher is a huge passion for me. Already at high school I was dreaming about this job I found very challenging and exciting. The work of researcher is never a routine. In fact, it is a never-ending story of searching new ideas, innovations and projects which brings you to new findings and challenges pushing you further in your scientific research. It depends on you if your ideas become reality, and if successful, the personal satisfaction is priceless.

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What is your project about? What objectives do you have to reach?

My research activity in CARENA project involves several topics aiming the development of both dense ceramic proton conducting and microporous crystalline membrane materials including advanced membrane-catalyst microstructures.
More specifically, in the framework of WP2 I work on an innovative method for the sintering/consolidation of perovskite materials applying MW-assisted heating. This method targets the preparation of supported dense proton conduction membranes as selective H_2 extractor (an alternative to palladium-based membrane materials).
Concerning microporous membrane materials, I focus on the development of selected MOF-based membranes for the separation of H_2, propane, propene (WP2) and other low weight carbon fractions. Moreover, I am also involved in the synthesis and evaluation of MFI membranes because of their potential in separation of water/methanol/CO_2 mixtures (WP3) or C3-C4 fractions (alkanes and their corresponding olefins), eventually H_2/propene or H_2/propane mixtures (WP2). Last but not least I work also in a close cooperation with IRCELyon on the development of model structured catalysts improving the kinetic of DMC synthesis from MeOH and CO_2 (WP5).

IEM building

The CARENA project has been designed with a strong emphasis on multidisciplinary approach. What is the best thing about taking part in a project like CARENA? How challenging is it?

The principal asset of the project bears on gathering an impressive number or top-level research scientists who can share their knowledge and expertise in various fields, exchange and discuss the results and ideas which could be more efficiently adjusted due to the team work spirit. The multidisciplinary approach is thus a key condition to increase the chance in reaching the targets of such challenging project as CARENA with a great potential for original outputs thanks to a joint work of highly motivated partners across the Europe.

What did you learn from your participation to national/international events during your time in the CARENA project?

During my time in CARENA project I had an opportunity to present my results at several national and international scientific events. In addition, I had a chance to participate on CARENA annual progress meetings, where I could share the results obtained in our laboratory with other members of the CARENA team. Such events were for me always a really great experience associated with fruitful and motivating discussions resulting in new ideas I am trying to implement in my current research projects. In addition, my participation on the meeting provided me with new contacts to a number of outstanding researchers which is a very important for my further scientific carrier.

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

Cooperation between the academia and industry is an important point, highly beneficial for improving the work in the laboratory. In fact, the current trend in research and its funding aims a closer research-industry collaboration pushing the scientists to keep in mind not only the scientific but also commercial aspect of their work. Because of my previous experience with numerous industrial partners, I have already learned how different approach people in academia and industry might have and how tedious the transfer from lab-scale level to a commercially attractive end-product could be. The strategy of bringing together and reinforcing a teamwork between the research labs, SMEs and industry in CARENA project is of an utmost importance in paving new collaboration and developing novel technologies which could be directly implemented in real life applications.

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 principal added value of a big project such as CARENA bears on an outstanding possibility to create a rich network of researchers from different countries combining their different expertise but also diverse cultural backgrounds which open the way to new and attractive solutions during collaboration on joint projects. In addition, involving numerous PhD students and postdoctoral researchers is highly beneficial not only for the project itself but also for formation of new generation of well-trained and open-minded scientists.

Is there anything else you would like to add to your interview?

I would like to point out that my involvement in CARENA project represents a very important milestone in my scientific carrier. Besides of having a possibility to work on challenging and highly interesting research topics, my recruitment as a postdoctoral researcher enabled me to work in the team of Dr. Anne Julbe at IEM – an internationally recognized laboratory with high level of expertise.
In addition, another added value of my research activity in CARENA was a significant broadening of my scientific expertise, which surely played a positive role during the recruitment process for obtaining my current permanent position at CNRS.

Thank you Martin for answering my questions, and all the best for CARENA and the other projects you are involved in.

Interviewed by Laurence Bosch

CARENA in brief
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