



DN-MSCA-Horizon Europe
Grant n°101119277

In the frame of the Doctoral Network MSCA Horizon Europe “ChimSep” dedicated to the integration of membrane separations (Organic solvent nanofiltration and membrane distillation) in fine chemistry, 13 PhD projects are funded for 36 months: 8 dealing with membrane science and 5 dealing with homogeneous catalysis.

See all the 13 projects at <https://theses.doctorat-bretagne.fr/dn-chimsep>

Title- PhD#9: Membranes and Process relationship in the design of sustainable, technical-economic new industrial OSN separations applied to transfer hydrogenation in ethanol.

Joint doctorate

Offer description

PhD#9 will establish a joint optimization of membrane performance and of the separation scheme to design sustainable processes involving organic solvent nanofiltration (OSN) on transfer hydrogenation of furfural reaction mixture using commercial polymer membranes.

At KU Leuven (20 months), after selection of the appropriate Polyimide (PI) membrane, he/she will collect the OSN performances that will be further used for OSN transfer mechanisms elucidation with cross-feedback between all the 8 Membranologist PhDs of the doctoral network dealing with transfer and Chemist PhD#8 working on the same reaction.

At University of Rennes (ISCR-CIP, France), OSN cascades applied to the same reaction will be theoretically studied. This involves an exploration of cascade parameters and configurations, in which separation requirements for the reactions in ethanol are linked to technical processing options (with cross-feedbacks with the 4 Membranologist PhDs of the doctoral network dealing with cascades).

Finally, fractionation processes will be proposed based on OSN cascades or on a hybrid process coupling OSN and distillation and theoretically studied for the studied reaction in close relationship with our private partner ProSim aiming at membrane & distillation modelling.

4 months will be spent at **ProSim (France)** to acquire knowledge on their process software use either for membrane & distillation modelling

The preparation of the PhD thesis and defence will be finalized at KU Leuven

Keywords:

Membrane separation, organic solvent nanofiltration, homogeneous catalysis, distillation, process modelling, membrane cascade

PhD starting date: 01/11/2023

Application deadline: 31/08/2023 (23:59:00, Paris)

<https://theses.doctorat-bretagne.fr/dn-chimsep>

Work location: Leuven, Belgium (two year) & Rennes, France (one year)

The Doctoral Candidate will be enrolled in a joint doctorate between two partners of the network. He/she will spend 20 months with the hosting partner (KU Leuven, Belgium) of the present application and then a mobility of 12 months at University of Rennes, France.

During the doctoral period, the PhD will also spend 4 months at ProSim, France working with process software.

Contacts

Thesis main supervisor (Belgium)

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Required Education Level : Master degree or equivalent

Skills/Qualifications

The candidate will hold a Master degree or equivalent in chemical engineering or in chemistry with competencies in processes and/or membrane processes.

A previous experience in handling membrane processes will be appreciated

Knowledge of analytical characterization techniques, in particular UV spectrometry and gas chromatography, will be appreciated

Enthusiasm, autonomy, scientific curiosity and ability to communicate are required qualities.

Required Language: English, level: Good

Required research experience

An internship of several months in a research laboratory involved in membrane separation will be appreciated

Website for additional job details;

See application platform: <https://theses.doctorat-bretagne-loire.fr/dn-chimsep>
section "Présentation de l'école doctorale » (doctoral network presentation)

Salary

The selected PhD-candidate will be assigned full-time with a PhD scholarship with full social security.

The EU provides support for each recruited researcher in the form of

- Gross salary per month: close to 2 375 € (net should be around 1 890 €)
- + 600 € of mobility allowance. All eligible researchers recruited within a DN are entitled to receive this allowance. It contributes to the private mobility related expenses of the researcher.
- + 495 € of family allowance per month (if eligible to the conditions: be married or equivalent and/or have a child; family, long-term leave and special needs allowances. The family status of a researcher will be determined at the date of their (first) recruitment in the action and will not evolve during the action lifetime