DC5 Position

Project Title: Heterogeneous catalysis for cyclic carbonate synthesis via tandem epoxidation/ carbonation

Host Institutions:

- Main Host Institution – University of Groningen (RUG) - The Netherlands (21 months)
- Secondary Host Institution - ICIQ - Spain (15 months)

Project Description: The project will involve the design and development of heterogeneous catalysts that are able to promote the two steps of a tandem reaction affording functional cyclic carbonates directly from alkene precursors. Gallium oxides and titanosilicates will be used to promote the epoxidation step, whereas different designs of heterogeneous catalysts will be investigated for the conversion of the formed epoxides into cyclic carbonates in the presence of CO_2. The possibility of tuning the chemo-selectivity by changing the ratio and type of Lewis acid and (halide) additive of this second step to favour polycarbonates will also be investigated. Particular attention will be devoted to the compatibility of the oxidant used in the epoxidation step with the catalysts used in the formation of the carbonate product. The stability of the catalysts against impurities present in CO_2 from industrial sources will be investigated and optimised. At ICIQ the tandem reaction will be attempted using homogeneous catalysts based on Al/Fe complexes combined with halide additives such as TBAB.

Secondment: the project involves a three-months research stay at CELABOR facilities (Belgium) under the supervision of Dr. Jean-Michel Thomassin (to study potential applications of the generated polycarbonates)

Enrolment in Doctoral degree: DC5 will be enrolled in RUG and URV (University Rovira i Virgili), obtaining two PhD titles, according to a specific agreement between the two universities.

Candidate Profile:

- Candidates should have an excellent academic record, strong commitment to scientific research and a solid working knowledge of English
- International experience and a commitment to interdisciplinary research are appreciated.
- Expertise in catalysis is appreciated
- Candidates must have a Master's or an equivalent degree in the area of Chemical Engineering, Chemistry or related disciplines that must be completed by the time of admission in the PhD programmes (around September 2023).

Eligibility criteria:

- Researchers must be doctoral candidates (not already in possession of a doctoral degree at the date of recruitment)
- Recruited researchers can be of any nationality and must comply with the following mobility rule: must not have resided or carried out his/her main activity (work, studies,

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et.) in the country of the **main** host institution for more than 12 months in the 36 months immediately before the recruitment date (October 2023)

Local eligibility criteria:

- For RUG: No additional requirements
- For ICIQ: You must have a master's degree or at least 300 ECTS (of which at least 60 ECTS belong to the master's degree) or an equivalent degree which allows you to start a PhD

Employment conditions:

- Host institution (s)
  - University of Groningen (The Netherlands)
  - Institute of Chemical Research of Catalonia (Spain)
- Supervisor (s): Prof. Paolo Pescarmona & Prof. Arjan Kleij
- Starting date: October 2023 (estimated)
- Duration: 36 months, full-time employment
- Gross salary:
  - RUG: 30.492€/ first year (including mobility allowance), which will then increase according to Collective labour Agreement for Dutch Universities
  - ICIQ: 33.000€/year (including mobility allowance)

How to apply:

Complete applications are written in English and include:

- A complete application form
- A letter of motivation (maximum 2 pages)
- Diploma and academic record* of both the bachelor's and the master's degree. If not originally in English, an official translation could be requested.
- Contact details of two referees (Note that referees will be only contacted for short-listed candidates)
- Proof of English language proficiency

  * The academic record must include the range of marks used in the corresponding countries and the minimum mark to pass, as well as the hours or ECTS and marks for each subject.

Application deadline: 19/07/2023

Selection process: The interviews will take place online

For more information: https://dcarbonizeproject.eu/dc-positions/

Contact person: Anna Banet (info@dcarbonizeproject.eu)

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