

Chemical Recycling of Oxygenated Polymer Materials into High-Added Products

Host institute:

The **Unit of Separation and Conversion Technology** (SCT, Flemish Institute for Technological Research, VITO) develops technologies for the sustainability of production processes in the (bio)chemical sector, replacement or reuse of fossil resources for the chemical industry and the treatment of waste streams into high value chemicals. A strategic research theme is focusing on the reuse of carbon as an alternative feedstock for the production of materials. In this perspective, chemical recycling of waste plastics is in line with VITO's goal which is to accelerate the transition to a sustainable world where sustainability is the norm.

The **Laboratory for Chemical Technology** (LCT) integrates chemical science and engineering in its research on catalysis, polymerization, kinetics, reactor design and process design. LCT is part of the Department of Materials, Textiles and Chemical Engineering within the Faculty of Engineering and Architecture at Ghent University in Belgium and member of the Centre for Sustainable Chemistry (CSC) of Ghent University. LCT aims at research excellence and bottom-up innovation in the framework of technological, industrial, and societal challenges. More information available on www.vito.be and <https://www.lct.ugent.be/>

Up to now, VITO has developed strong expertise in chemical depolymerization technology. Indeed, VITO has renowned reputation in the field of biomass valorization through conversion of lignocellulose into value-added lignin fragments and bio-aromatic derivatives. Furthermore, VITO holds a solid knowledge in polymer formulation using depolymerized complex mixtures as building blocks.

We are looking for a master student for a 4 years PhD research to work within our Sustainable Polymer Technologies (SPOT) team with a focus on the development of a chemical recycling method to chemically recycle oxygenated polymer waste into multifunctional depolymerization products which will be subsequently re-polymerized to generate a wide array of functional materials.

Closing date for applications: 30/06/2021

Starting date (after positive evaluation): 1/10/2021

Project Description:

This position fits within a national collaborative project between VITO and Ghent University. This research project will involve aspects of catalysis, characterization of complex depolymerization mixtures, chemical modification and evaluation in polymer formulations.

The following tasks/actions are foreseen in our project to be conducted by the candidate, focusing on the chemical recycling of oxygenated polymer waste with a focus on polyesters, polycarbonates and polyethers:

- Active literature survey, keeping up to date with relevant articles and patents in the fields
- Detailing out the work protocol after discussion with the experts involved
- Execution of the work in laboratory
- Data interpretation and plan for next possible steps: in discussion with experts
- Execution of the experiments/tasks in a timely and efficient manner according to the overall project planning
- Preparing presentations for the meetings/reports.
- Scientific output and/or patent submission as a result of the work would be highly recommended
- Ensure compliance with VITO/UGent's Health & Safety Policy, and take a proactive approach to ensure all experimental work is safe

Required education/discipline/profile of candidates:

- PhD in Chemistry/Chemical Engineering
- Background in polymer design and synthesis or catalysis is recommended
- Knowledge on working on process development is an asset, as well as conceptual design know how.
- You have a result-driven character capable of translating theory to practice and vice versa and are able to find solutions.

- You are proactive, motivated and an excellent team player who enjoys working in a multidisciplinary environment
- You are interested to acquire hands-on experience by running innovative experimental set-ups.
- You are fluent in English and eager to write scientific papers and/or patents

Contact persons for more information:

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