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## *COST ACTION GREENERING – DATA COLLECTION*

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**First name, Family Name:** Geert Verheyen  
**Type (Academic or Industrial):** Academic  
**Country:** Belgium  
**Leadership position in the COST:** Participant  
**Working Group in which you are involved:** WG3  
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**Laboratory/Company:** RADIUS – Thomas More University of Applied Sciences

**Laboratory/Company info:**

Thomas More Kempen (TMK) aims to organise higher education in the broad sense of the word. This means the organisation of educational activities, of practice-based scientific research, of scientific services and of student facilities. The aim of the RADIUS research group is to provide research and advice with a focus to sustainability. One of the research topics is sustainable process technology.

**Link to the home page of the Laboratory/Company:**

<https://www.thomasmore.be/en/welcome>

<http://radius.thomasmore.be/>

**Fields of expertise:**

- sustainable process technology for greener and more sustainable processes
- the production and use of bio-based chemicals
- advanced distillation technology for the separation of mixtures
- membrane filtration (micro, ultra and nanofiltration)
- microreactor technology and flow chemistry
- in silico modelling to predict physico-chemical and/or biological activities and/or optimization of processes.

**5 Main publications or patents:**

- G.R. Verheyen, T. Ooms, L. Vogels, S. Vreysen, A. Bovy, S. Van Miert and F. Meersman, 'Insects as an Alternative Source for the Production of Fats for Cosmetics', J. Cosmet. Sci 69, 187-202, 2018
- Ooms, T., Vreysen, S., Van Baelen, G., Gerbaud, V., Rodriguez-Donis, I. (2014). Separation of ethyl acetateisooctane mixture by heteroazeotropic batch distillation. CHEMICAL ENGINEERING RESEARCH & DESIGN, 92 (6), 995-1004.
- Genduso, G., Amelio, A., Luis, P., Van der Bruggen, B., Vreysen, S. (2014). Separation of methanol-tetrahydrofuran mixtures by heteroazeotropic distillation and pervaporation. AIChE Journal, 60 (7), 2584-2595.
- Luis, P., Amelio, A., Vreysen, S., Calabro, V., Van der Bruggen, B. (2014). Simulation and environmental evaluation of process design: Distillation vs. hybrid distillation-pervaporation for methanol/tetrahydrofuran separation. Applied Energy, 113, 565-575.



- Vreysen, S., Vandezande, P., Degève, J., Van der Bruggen, B. (2012). Separation of ethyl acetate–isooctane mixtures by pervaporation and pervaporation-based hybrid methods. *Chemical Engineering Journal*, 210, 252-262.

#### **Collaborations:**

- Universities: KU Leuven, Universiteit Antwerpen, Maastricht Universiteit
- Research institutes: VITO, Inagro, Centexbel
- University colleges: Fontys hogeschool, Hogeschool Zuyd, VIVES, HAS Hogeschool
- Chemical companies: Janssen Pharmaceutica, Ajinomoto Bio-Pharma Services, TransFurans Chemicals, Ineos Styrolution, Stahl, Limburgse Urethaanchemie, LIPA Family, Oleon, Mylène, EOC group, Christeyns, Lipafamily, Eastman, Renewi,...
- Insect breeding companies: Circular organics, Proteinfarm, Protix, Bestico

#### **Facilities:**

- Facilities for microalgae breeding at lab and pilot scale in a closed photobioreactor
- Facilities for insect breeding at pilot scale in an Insect Pilot Plant
- Pilot installation for chemical process technology (various distillation columns, reactors, etc.) which makes it possible to carry out chemical reactions and separation processes on a pilot scale
- Various chemical analyses with GC, HPLC, Karl-Fischer, IR, UV-VIS, ICP, AAS and UV-VIS, which make it possible to monitor the various processes and the quality of end products.
- Computer software to model and build predictive models. These models can be used for the production of biomass and also for the estimation of the properties (physico-chemical and biological) of substances.