

A. Synopsis

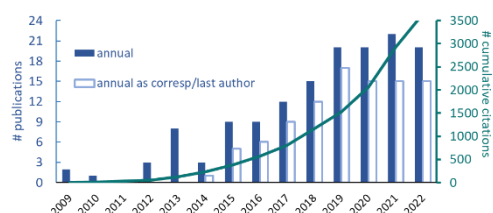
Dagmar R. D'hooge (°1983; PhD in Chem. Eng. 2010; assoc. prof. at **Ghent University** since 2016) focuses on the sustainable design of (de)polymerization and polymer processing techniques. The functional material design & process intensification is performed up to the industrial scale, using advanced in-house developed multi-scale modeling tools in combination with experimental validation. He performs research in chemical engineering, materials science, polymer science, and mechanics/rheology. He is a (co-)lecturer for polymer engineering courses at the Faculty, covering e.g. polymer reaction engineering, physics and processing.

He was a postdoctoral researcher in the Matyjaszewski Polymer Group (**Carnegie Mellon University**, Pittsburgh, USA) in 2011 and in the Macromolecular Architectures (MacroArc) Research Team (**Karlsruhe Institute of Technology**, Germany) in 2013. He is also a former postdoctoral researcher of the Fund for Scientific Research Flanders (FWO Vlaanderen). Since 2017 he is a **visiting Associate Professor at Stanford University**. He is the elected head of the Department Materials, Textiles and Chemical Engineering since Oct. 2022 (350 employees).

He is coauthor of **150** peer-reviewed full length research articles, 6 book chapters, 1 book, and 3 granted patents, and coeditor of 1 book. He is an invited member of the International Union of Pure and Applied Chemistry. Since 2015, he has been involved **13.1 M€ of research grants** of which 7.6 M€ as PI/Promotor, 3.6 M€ as co-PI, and 1.9 M€ as partner. He is a former ERC starting grant runner-up.

He is the cofounder of **two spin-offs**, one dealing with software-based design for polymer synthesis and recycling (launched in 2021) and one producing sustainable polymer products in sport applications (to be launched in Jan. 2022). Further valorization has been realized by the development of new sustainable polymer-based floor systems, currently commercialized by a SME.

URL <https://www.lct.ugent.be/research/polymer-design>



B. Five main scientific publications

L. De Keer, K. Karsu, P.H.M. Van Steenberge, L. Daelemans, D. Kudora, H. Frisch, K. De Clerck, M.F. Reyniers, C. Barner-Kowollik, R.H. Dauskardt, D.R. D'hooge* 'From time dependent building blocks during synthesis to application properties for inorganic and organic three-dimensional network polymers' *Nat. Mater.* **2021** 20, 1422 (SCI-IF 2020: **43.8**; **cover article**); times cited: 40

In silico 3D functional group chemical kinetics for advanced chemical structure-property relationships

A. Kislyak, D. Kudora, H. Frisch, F. Feist, P.H.M. Van Steenberge, C. Barner-Kowollik, D.R. D'hooge* 'A holistic approach for anthracene photochemistry kinetics' *Chem. Eng. J.* **2020**, 402, 126259 (SCI-IF 2019: **10.7**); times cited: 16

Reaction laws at any wavelength in view of sustainable material design

P.H.M. Van Steenberge, O. Sedlacek, J. Hernandez-Ortiz, B. Verbraeken, M.-F. Reyniers, R. Hoogenboom, D.R. D'hooge* 'Visualization and design of the functional group distribution during statistical copolymerization' *Nat. Commun.* **2019** 10, 1 (SCI-IF 2018: **11.9**); times cited: 30

Molecular fingerprinting for copolymerization kinetics for commodity and high-tech polymers

K. De Smit, Y.W. Marien, K.M. Van Geem, P.H.M. Van Steenberge, D.R. D'hooge* 'Connecting polymer synthesis and chemical recycling on a chain-by-chain basis: a unified matrix-based kinetic Monte Carlo strategy' *React. Chem. Eng.* **2020** 5, 1909 (SCI-IF 2020: **4.3**; **cover article**); times cited: 30

Reaction path analysis for polymer circularity starting at the molecular scale

L. Duan, M. Spoerk, T. Wieme, P. Cornillie, H. Xia, J. Zhang, L. Cardon, D.R. D'hooge* 'Designing formulation variables for extrusion-based manufacturing of carbon black conductive polymer composites for piezoresistive sensing' *Compos. Sci. Technol.* **2019**, 171, 78 (IF **6.3**); times cited: 45

Smart use of engineering tools to facilitate economically feasible high-tech polymeric applications

C. Scientific achievements

Full length research articles: 150 (95 last/corresp. author); *h*-index: 34; timed cited: 3671 (WoS)

Presentations at conferences, colloquia/ workshops: > 100; 17 invited of which 4 keynotes; 1 plenary

10 examples of recognition by peers

Prog. Polym. Sci. (SCI-IF (2015): **27.2**) contribution in 2016; first & corresponding author; invited

J. Am. Chem. Soc. contribution (SCI-IF (2016): **12.1**) in 2016; highlighted in Chemistry views

2 *Adv. Func. Mater.* contributions (SCI-IF (2017): **13.3**): 2018: cover; 2019: corresp. author & cover

Angew. Chem. Int. Ed. contribution (SCI-IF (2017): **12.1**) in 2019; corresponding author

Nature Communications contribution (SCI-IF (2018): **11.9**) in 2019; corresponding & last author

Macromolecules perspective (SCI-IF (2018): **5.9**) in 2019; corresponding & last author; invited

Prog. Mater. Sci. contribution (SCI-IF (2020): **31.6**) in 2020; corresponding author; highly cited WoS

Prog. Energy Combust. Sci. contribution (SCI-IF (2020): **30.9**) in 2021; invited; highly cited WoS

Nature Materials contribution (SCI-IF (2020): **43.8**) in 2021; corresponding & last author & cover

Group/Alumni: 3/3 postdocs; 16/15 PhD students; 3/38 Master thesis students

Fellowships and awards:

19 cover articles, including Nat. Materials, Adv. Funct. Mater., Macromolecules, React. Chem. Eng. editor's choice for MDPI publication addressing polymer composite design in 2022

I&EC Review Award in 2021 and 2022

Outstanding Polym. Chem. Reviewer Award in 2019 & 2020

Jozef Plateau award for promoting Master thesis on polymer design & engineering in 2016 & 2020

leading young scientist recognition: special issue "Macromol. Rapid. Commun." in 2018

best of Macromolecular journals ("top 9 out of 1300 manuscripts") in 2012, 2013, 2017 & 2018

identified as "Rising Star in Polymer Engineering" by scientific committee of **ISCRE 24** in 2016

poster award at Annual Belgian Polymer Group meeting in 2013 & 2014

National Science Foundation (FWO) postdoctoral research fellowship: 2 terms

Solvay award Chemistry for Master thesis on suspension polymerization in 2006

PhD scholarship at Agency for Innovation by Science and Technology Flanders in 2006: first ranking

Commissions of trust and memberships of scientific societies:

member of polymer division of International Union of Pure and Applied Chemistry (**IUPAC**)

evaluator for National Science Foundation (e.g. Canada, Swiss, the Netherlands; France; Spain)

reviewer of Belgian PhD and industrial proposals on "Polymer Technology" since 2014: 25

frequent reviewer for "Polymer Science", "Chemical Engineering", "Rheology", and "Materials Sci."

advisory board member "Polymer Chemistry" since 2018

guest editor and subsequent editorial board member of "Polymers" (SCI-IF: 4.3) since 2019

editorial board member of "Scientific Reports" (Nature publishing group; SCI-IF: 4.3) since 2021

D. Technical achievements

patents: 3 granted; 1 in preparation; **industrial valorization:**

computer licenses and launching of first spin-off; 1 sustainable material product development

commercialized by SME in 2021; second spin-off launched regarding sport innovation & engineering

E. Institutional achievements

elected chairman representing all Faculty assistant and associate professors since 2017

steering committee member valorization consortium "CleanChem" since 2014

member of educational committees at the Faculty since 2011; secretary until 2017

member of PhD examination committees; number of defenses > 40

elected head Department Materials, Textiles and Chemical Engineering since Oct. 2022

main contributor to task polymerization kinetic modeling for Eurokin consortium

organization of scientific meetings:

International Conference on Chemical Reactors in 2018; Polymer Reaction Engineering conference

in 2018; International Conference on Polymers & Moulds Innovations since 2016; International

Conference on Chem. Kinetics in 2015 and 2017; Milan Polymer Days since 2021

co-organizer course "Sustainable Reaction and Reactor Engineering" in 2015: EU level