# Curriculum Vitae

## Krzysztof Polaczek


**PERSONAL INFORMATION**

**Date and place of birth:** [redacted]
**Nationality:** [redacted]
**E-mail:** [redacted]
**ORCID:** 0000-0001-9526-1489


**EDUCATION**

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| 2018 – 2023 | **Ph.D. in Chemical Engineering**, Cracow University of Technology, Cracow, Poland.<br>Thesis title: "*Bio polyols from renewable resources for the synthesis of open cell polyurethane foams*". |
| 2015 – 2018 | **Master's in Chemical Technology,** with major in Polymer Technology, Cracow University of Technology, Cracow, Poland<br>Thesis title: "*Synthesis of bio-polyols from used cooking oils*". |
| 2012 – 2015 | **Bachelor of Engineering**, with major in Polymer Technology, Cracow University of Technology, Cracow, Poland.<br>Thesis title: "*Synthesis of bio-polyols from selected epoxidized oils derived from waste materials*". |

**LANGUAGES**

**Polish:** native
**English:** intermediate level (B2) with fluency in technical terminology
**Italian:** basic level (A2)

**RESEARCH INTERESTS**

- Chemical modification of vegetable oils for the synthesis of hydroxyl derivatives (bio-polyols) used in the production of polyurethanes.
- Development of open-cell polyurethane foams used as spray-applied thermal insulation materials.

**SCIENTIFIC PROJECTS EXPERIENCE**

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| 01.12.2020 – 31.08.2021 | **Project Title:** "*Development of Biobased Cryogenic Insulation Modified with Nanocrystalline Cellulose*". M-ERA.NET2/2017/2/2018.<br>**Role:** Project contractor.<br>**Funding:** European Commission and the National Centre for Research and Development in Poland.<br>**Awarded to:** Consortium consisting of Cracow University of Technology (Leader), Warsaw University of Technology (Partner), "Damiton" Company (Partner), Latvian State Institute of Wood Chemistry (International Coordinator). |
| 01.10.2018 – 31.12.2020 | **Project Title:** "*Development of Raw Material Recycling Technology for Used Vegetable Frying Oils and the Application of the Obtained Hydroxyl Bio-components for the Production of Innovative, Highly Efficient Polyurethane Thermal Insulation Materials*". LIDER/28/0167/L-8/16/NCBR/2017.<br>**Role:** Project contractor.<br>**Funding:** National Centre for Research and Development in Poland.<br>**Awarded to:** Cracow University of Technology. |

**INTERNATIONAL INTERNSHIPS**

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| 01.07.2021 - 01.09.2021 | Internship at the Latvian State Institute of Wood Chemistry, Latvia, Riga.<br>Research topic: determining the optimal conditions for synthesizing epoxidized fatty acids from tall oil using a rotating bed reactor. |

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## PEER-REVIEWED JOURNAL ARTICLES

- Polaczek K., Kurańska M., Malewska E., Czerwicka-Pach M., Prociak A. *From Bioresources to Thermal Insulation Materials: Synthesis and Properties of Two-Component Open-Cell Spray Polyurethane Foams Based on Bio-Polyols from Used Cooking Oil*, Materials, 2023, 16(18), 6139.
- Kurańska M., Ptak M., Malewska Elżbieta., Prociak A., Barczewski M., Dymek M., Fernandez F., Sousa R. Polaczek K., Studniarz K., Uram K., *Cork Porous Biocomposites with Polyurethane Matrix Modified with Polyol Based on Used Cooking Oil*, Materials, 2023, 16(8), 3032.
- Barczewski M., Kurańska M., Sałasińska K., Aniśko J., Szulc J., Szafraniak-Wiza I., Prociak A., Polaczek K., Uram K., Surmacz K., Piasecki A., *Comprehensive analysis of the influence of expanded vermiculite on the foaming process and selected properties of composite rigid polyurethane foams*, Polymers, 2022, *14*(22), 4967.
- Polaczek K., Kurańska M., *Hemp seed oil and oilseed radish oil as new sources of raw materials for the synthesis of bio-polyols for open-cell polyurethane foams, Materials*, 2022, *15*(24), 8891.
- Malewska E., Polaczek K., Kurańska M., *Impact of various catalysts on transesterification of used cooking oil and foaming processes of polyurethane systems*, Materials, 2022, 15(21), 7807.
- Kamińska K., Barczewski M., Kurańska M., Malewska E., Polaczek K., Prociak A., *The Effect of a Chemical Foaming Agent and the Isocyanate Index on the Properties of Open-Cell Polyurethane Foams, Materials*, 2022, *15*(17), 6087.
- Polaczek K., Kaulina E., Pomilovskis R., Fridrihsone A., Kirpluks M., *Epoxidation of tall oil fatty acids and tall oil fatty acids methyl esters using the Spinchem® rotating bed reactor*, Journal of Polymers and the Environment, 2022, 30, 4774–4786.
- Kurańska M., Cabulis U., Prociak A., Polaczek K., Uram K., Kirpluks M., *Scale-up and testing of polyurethane bio-foams as potential cryogenic insulation materials*. Materials, 2022, 15(10), 3469.
- Polaczek K., Kurańska M., Prociak A., *Open-cell bio-polyurethane foams based on bio-polyols from used cooking oil*. Journal of Cleaner Production, 2022, 359, 132107.
- Polaczek K., Kurańska M., Auguścik-Królikowska M., Prociak A., Ryszkowska J., *Open-cell polyurethane foams of very low density modified with various palm oil-based bio-polyols in accordance with cleaner production*. Journal of Cleaner Production, 2021, 290, 125875.
- Kurańska M., Malewska E., Polaczek K., Prociak A., Kubacka J., *A pathway toward a new era of open-cell polyurethane foams—influence of bio-polyols derived from used cooking oil on foams properties*, Materials, 2020, 12(22), 5261.
- Kurańska M., Benes H., Sałasińska K., Prociak A., Malewska E., Polaczek K., *Development and characterization of "green open-cell polyurethane foams" with reduced flammability*, Materials, 2020, 13(23), 5459.
- Kurańska M., Barczewski R., Barczewski M., Prociak A., Polaczek K., *Thermal insulation and sound absorption properties of open-cell polyurethane foams modified with bio-polyol based on used cooking oil*, Materials, 2020, *13*(24), 5673.
- Kurańska M., Polaczek, K., Auguscik-Krolikowska, M., Prociak, A., Ryszkowska, J., *Open-cell polyurethane foams based on modified used cooking oil*. Polimery, 2020. 65 (3), 216–225.
- Kurańska M., Polaczek, K., Auguścik-Królikowska, M., Prociak, A., Ryszkowska, J., *Open-cell rigid polyurethane bio-foams based on modified used cooking oil*. Polymer, 2020, 190, 122164.
- Kurańska M., Banaś, J., Polaczek, K., Banaś, M., Prociak, A., Kuc, J., Uram, K., Lubera, T. *Evaluation of application potential of used cooking oils in the synthesis of polyol compounds*. Journal of Environmental Chemical Engineering, 2019, 7(6), 103506.
- Kurańska M., Beneš, H., Polaczek, K., Trhlikova, O., Walterova, Z., & Prociak, A. *Effect of Homogeneous Catalysts on Ring Opening Reactions of Epoxidized Cooking Oils*. Journal of Cleaner Production, 2019, 230, 162–169.

## CONTRIBUTIONS TO MONOGRAPHS

- Polaczek K., Kurańska M., *Hemp seed oil as new source of raw materials for the synthesis of bio-polyols for open-cell polyurethane biofoams*. Modern polymeric materials for environmental applications. 8th International Seminar including Special Session 'Polyhydroxyalkanoates: synthesis, modification and applications'. Vol. 8, Iss. 2. ISBN: 978-83-966714-0-0.
- Prociak A., Uram K., Polaczek K., Leszczyńska M., Malewska E., Pulit-Prociak J., Czajka A., Michałowski S., Ryszkowska J., *Polyurethane thermal insulations with renewable raw materials*. Modyfikacja polimerów: stan i perspektywy w roku 2021. ISBN: 978-83-86520-25-1.
- Kurańska M., Polaczek K., Sałasińska K., Malewska E., Prociak, A., Open-cell polyurethane foams modified with bio-polyol based on used cooking oil. Modyfikacja polimerów: stan i perspektywy w roku 2021. ISBN: 978-83-86520-25-1.
- Kurańska M., Polaczek K., Prociak A., *Modified used cooking oils an environmentally friendly reactive components for modern polymeric materials*. Modern polymeric materials for environmental

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applications. 7th International Seminar including Special Session 'Recent advances in polymer nanocomposites and hybrid materials', Vol. 7. ISBN: 978-83-937270-6-3.

- Polaczek K., Kurańska M., Prociak A., *Influence of the chemical structure of bio-polyols from used cooking oils on the properties of open-cell PUR foams*. Modyfikacja polimerów: stan i perspektywy w roku 2019. ISBN: 978-83-86520-24-4.

## ORAL CONFERENCE PRESENTATIONS

- VIII Scientific Conference on Polymer Materials "Pomerania-Plast 2023", May 24-26, 2023, Międzyzdroje, Poland. Authors: Polaczek K., Kurańska M., Prociak A., Presentation Title: *"Open-Cell Polyurethane Foams Modified with Bio-Polyol Produced Using a High-Pressure Spray Device"*.
- Scientific and Technical Conference "MAT-PUR 2022", October 10-12, 2022, Smardzewice, Poland. Authors: Polaczek K., Kurańska M., Prociak A., Presentation Title: *"Sprayable Open-Cell Polyurethane Foams Modified with Bio-Polyol from Used Cooking Oil"*.
- Interdisciplinary Academic Conference on Environmental Protection "IAKOŚ 2022", September 21-23, 2022, Gdańsk, Poland. Authors: Polaczek K., Kurańska M., Prociak A., Presentation Title: *"Open-Cell Spray Polyurethane Foams with Low Apparent Density Modified with Bio-Polyol from Used Cooking Oil"*.
- International Scientific Conference "Times of Polymers and Composites TOP2021", September 5-9, 2021, Ischia, Italy. Authors: Polaczek K., Kurańska M., Prociak A., Presentation Title: *"Open-Cell Spray Polyurethane Foams of Low Density Modified with Bio-Polyol from Used Cooking Oil"*.
- Scientific and Technical Conference "Poliuretany 2019", October 13-16, 2019, Ustroń, Poland. Authors: Polaczek K., Kurańska M., Prociak A., Presentation Title: *"Thermal Insulating Open-Cell Polyurethane Foams with Bio-Polyols"*.
- Scientific Conference on Polymer Modification "Modyfikacja Polimerów", Zakopane, August 15-18, 2019. Authors: Polaczek K., Kurańska M., Prociak A., Presentation Title: *"The Impact of the Chemical Structure of Bio-Polyols from Used Cooking Oils on the Properties of Open-Cell PUR Foams"*.
- Modern Polymeric Materials for Environmental Applications, 7th International Seminar, Kraków, Poland, May 15-17, 2019. Authors: Kurańska M., Polaczek K., Prociak A., Presentation Title: *"Modified Used Cooking Oils as Environmentally Friendly Reactive Components for Modern Polymeric Materials"*.
- V Interdisciplinary Conference "EUREKA", Krzyżowa, Poland April 29-30, 2019. Authors: Kurańska M., Polaczek K., Presentation Title: *"Possibilities of Using Waste Raw Materials in the Synthesis of Polymeric Materials"*.

## PATENTS AND KNOW-HOW

- Polish Patent No. PL242255B1 entitled: *"Method of Producing Open-Cell Polyurethane Foam"*. Inventors: Maria Kurańska, Aleksander Prociak, Krzysztof Polaczek.
- Registered Know-How at the Center for Technology Transfer of Cracow University of Technology (Registration No. PK1886, Date: 13.05.2022). Title: *"Method of Producing Polyol Component from Epoxidized Vegetable Oil and/or Used Cooking Oil"*.

## ADDITIONAL SKILLS

- Driving license: Category B
- Familiar with software programs: OriginLab, ChemDraw, Image J, AutoCAD, testXpert II

*I authorize the processing of personal data present in the CV pursuant to Legislative Decree. Lgs. 101/2018 and of the GDPR (EU Regulation 2016/679).*

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6) I cittadini di Stati non appartenenti all'Unione, regolarmente soggiornanti in Italia, possono utilizzare le dichiarazioni sostitutive di cui agli artt. 46 e 47 del D.P.R. 445 del 28.12.2000 limitatamente agli stati, alla qualità personali e ai fatti certificabili o attestabili da parte di soggetti pubblici italiani, fatte salve le speciali disposizioni contenute nelle leggi e nei regolamenti concernenti la disciplina dell'immigrazione e la condizione dello straniero. Al di fuori dei casi sopradetti, i cittadini di Stati non appartenenti all'Unione autorizzati a soggiornare nel territorio dello Stato possono utilizzare le dichiarazioni sostitutive nei casi in cui la produzione delle stesse avvenga in applicazione di convenzioni internazionali fra l'Italia e il Paese di provenienza del dichiarante.