



UNIVERSITATEA BABEȘ-BOLYAI
BABEȘ-BOLYAI TUDOMÁNYEGYETEM
BABEȘ-BOLYAI UNIVERSITÄT
BABEȘ-BOLYAI UNIVERSITY
TRADITIO ET EXCELLENTIA

Tradiție și Excelență prin
Cultură - Știință - Inovație din 1581



Facultatea de Chimie și Inginerie Chimică
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TOPICS OF THE PHD SUPERVISORS for Admission to the Doctoral Studies in Chemical Engineering July and September 2026

PhD supervisor Prof. habil. dr. eng. Réka BARABÁS

1. Fundamentals of nano-biomaterials. Preparation methods
2. Engineering of nano-biomaterials
3. Characterization of nano-biomaterials

Bibliography

1. C. Bréchnignac, P. Houdy, M. Lahmani: *Nanomaterials and Nanochemistry*, Springer-Verlag Berlin Heidelberg, 2007
2. K. Ohno, M. Tanaka, J. Takeda, Y. Kawazoe: *Nano- and Micromaterials*, Springer, Heidelberg, 2008
3. Guozhong Cao: *Nanostructures Nanomaterials Guozhong Cao*, Imperial College Press, 2004
4. Venina dos Santos, *Rosmary Nichele Brandalise*, Michele Savaris: *Engineering of Biomaterials*, Springer, 2017

PhD supervisor Prof. habil. dr. eng. Ana-Maria CORMOȘ

1. Modeling and simulation of chemical and biochemical processes.
2. Dynamic modeling and simulation of carbon dioxide capture processes.
3. Multiscale modeling of heterogeneous gas-solid processes (catalytic and non-catalytic).

Bibliography

1. W.L., Luyben, *Process modeling simulation and control for chemical engineers*, second edition, McGraw-Hill, 1996;
2. O. Levenspiel, *Chemical reaction engineering*, John Wiley & Sons, New York, 1999;
3. A. Imre-Lucaci, A. M. Cormoș, MATLAB, exemple și aplicații în ingineria chimică, Ed. Presa Universitară Clujană, Cluj-Napoca, 2008;
4. S. Dragan, I. Siminiceanu, *Studii de caz în procese chimice gas-lichid și gaz-solid nectalite*, RISOPRINT, Cluj-Napoca, 2006;
5. B Roffel, B. Betlem, *Process Dynamics and Control*, John Wiley & Sons, New York, 2006;
6. C.C. Cormos, *Decarbonizarea combustibililor fosili solizi prin gazeificare*, Presa Universitara Clujana, 2008.



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**Tradiție și Excelență prin
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PhD supervisor Prof. habil. dr. eng. Călin Cristian CORMOȘ

1. Fundamental elements of chemical reaction engineering applied for homogenous and heterogeneous systems;
2. Fundamental elements of conceptual design and thermal integration of chemical processes;
3. Basic elements of CO₂ capture and utilization technologies.

Bibliography

1. O. Levenspiel, *Chemical reaction engineering*, John Wiley & Sons, New York, 1999.
2. E. Gavrilă, I. Bildea, V. Topan, S. Agachi, *Ingineria reacțiilor chimice. Utilaj specific*, Universitatea Babeș – Bolyai, Cluj – Napoca, vol. I+II, 1988.
3. C.C. Cormos, *Ingineria Reacțiilor Chimice, Aplicații practice pentru studiul reactoarelor omogene și eterogene gaz-lichid*, Presa Universitara Clujana, 2014.
4. R. Smith, *Chemical process – Design and integration*, 2-nd edition, John Wiley & Sons, 2016.
5. W.D. Seider, J.D. Seader, D.R. Lewin, *Product & process design principles*, John Wiley & Sons, 2004.
6. C.C. Cormos, *Decarbonizarea combustibililor fosili solizi prin gazeificare*, Presa Universitara Clujana, 2008.
7. Intergovernmental Panel on Climate Change (IPCC), Special report: *Carbon Dioxide Capture and Storage*, 2005, www.ipcc.ch.

PhD supervisor Prof. habil. dr. eng. Vasile Mircea CRISTEA

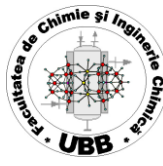
1. Fundamentals of modelling and simulation of the transfer phenomena (momentum, heat and mass) for systems with concentrated and distributed parameters;
2. Fundamentals of automatic control of chemical processes using classical algorithms and algorithms based on mathematical models;
3. Fundamentals of artificial intelligence: artificial neural networks, fuzzy logic and genetic algorithms;
4. Fundamentals of optimization and optimal control of chemical processes.

Bibliography

1. M.V. Cristea, P.S. Agachi, *Elemente de Teoria Sistemelor*, Editura Risoprint, Cluj-Napoca, 2002.
2. P.S. Agachi, M.V. Cristea, *Basic Process Engineering Control*, Editura Walter De Gruyter GmbH, Berlin, 2014.
3. P.S., Agachi, Cristea M.V., A.A. Csavdari, B. Szilagyi, *Advanced Process Engineering Control*, Editura Walter De Gruyter GmbH, Berlin, 2016.



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4. P.S. Agachi, *Automatizarea proceselor chimice*, Casa cărții de Știință, Cluj-Napoca, 1994.
5. A. Sipos, V. M. Cristea, E. Mudura, A. Imre-Lucaci, D. Bratfalean, *Modelarea, simularea și conducerea avansată a bioproceselor fermentative*, Editura Universității "Lucian Blaga" din Sibiu, Vol. II, 2010.
6. K.M. Hangoș, I.T. Cameron, *Process Modelling and Model Analysis*, Academic Press, 2001.

PhD supervisor Prof. habil. dr. eng. Graziella Liana TURDEAN

1. Nanomaterials. Structural characterization and properties of nanomaterials;
2. Chemically modified electrodes. Preparation methods;
3. Electrochemical techniques of investigation for bio/materials having redox, electrocatalytic or host-guest complexation properties. Cyclic voltammetry.

Bibliography

1. (a) Cao G., *Nanostructures and nanomaterials. Synthesis, properties, and applications*, Imperial College Press, 2004, chap 8, pp. 329-344;
(b) Hodoroaba V.-D., Unger W., Shard A., *Characterization of Nanoparticles: Measurement Processes for Nanoparticles*, 2019, pp. 7-217;
(c) Tantra R., *Nanomaterial Characterization: An Introduction*, 2016, pp. 153-179.
2. (a) Durst R. A., Baumner A. J., Murray R. W., Buck R. P., Andrieux C. P., *Chemically modified electrodes: recommended terminology and definitions*, Pure & App. Chem., 1997, 69(6), 1317-1323;
(b) Kenneth L. Brown, *Electrochemical preparation and characterization of chemically modified electrodes*, book chapter, DOI: 10.5772/intechopen.81752.
3. (a) Mureșan L., Oniciu L., *Electrochimie aplicată*, Presa Universitară Clujeană, Cluj-Napoca, 1998;
(b) Bard A. J., Faulkner L. R., *Electrochemical methods. Fundamentals and applications*, Wiley, New York, 2001, chap 6, p. 226-243;
(c) Kaifer A., Gomez-Kaifer M., *Supramolecular Electrochemistry*, Wiley, New York, 1999.