

Adam Mickiewicz University in Poznań

Faculty of chemistry

HighChem - interdyscyplinarne i międzynarodowe studia doktoranckie z elementami wsparcia współpracy międzysektorowej

Mechanochemical organic and coordination chemistry

Dr. Dawid Frąckowiak

Specialist training courses

Branch/ discipline	Exact and natural sciences/chemical sciences
Type of class	Lecture/lab
Language	English
ETCS	1 pt.
Duration	18
Aim of the course	Introduction of basic principles of mechanochemistry and its applications in organic and coordination chemistry
Course outline	<ul style="list-style-type: none"> • History and development of mechanochemistry • Physico-chemical aspects of mechanochemistry • Equipment for mechanochemical reactions (mortar/pestle, mixer mill, planetary ball mill) • Mechanochemical synthesis of organic, organometallic and coordination compounds • Medicinal mechanochemistry • Applications of mechanochemistry • Laboratory experiments (<i>synthesis of salen ligand and its Zn complex, mechanochemical Suzuki coupling</i>)
Prerequisites	Basic knowledge of organic chemistry (<i>nucleophilic addition, the catalytic formation of C-C bonds</i>) and coordination chemistry (<i>coordination number, ligands</i>)

Educational outcomes

After completing the course, the Ph.D. student can:	Verification
<ul style="list-style-type: none"> • understand the nature, methodology, and possibilities of scientific research in the area of mechanochemistry; • operate the scientific equipment for the mechanochemical synthesis (i.e., mixer- and planetary ball mill) and use it for the efficient synthesis of selected groups of organic and coordination compounds • understand the advantages of mechanochemical methods in synthesis over solvent-based methods (<i>green chemistry</i>) 	<ul style="list-style-type: none"> • Group discussion • Oral exam • Analysis of purity and spectra of the obtained products



	<ul style="list-style-type: none">understand the disadvantages of mechanochemical methods and options to improve their performance
Literature	<ol style="list-style-type: none">1) J. L. Do, T. Frišćić, <i>Synlett</i>, 2017, 28, 2066-20922) A. Stolle, T. Szuppa, S.E. S. Leonhardt, B. Ondruschka, <i>Chem. Soc. Rev.</i>, 2011, 40, 2317–23293) D. Margetić, V. Štrukil, <i>Mechanochemical Organic Synthesis</i>, Elsevier 2016, ISBN 978-0-12-802184-2
Detailed info	<p>Contact: dr. Dawid Frąckowiak, Center for Advanced Technology, Uniwersytetu Poznańskiego 10, lab B213; email: dawidoff@amu.edu.pl, tel: 61 829 1882, mobile: 608 287 827</p> <p>Proposed dates of classes (it is possible to change): 20–21.01, 27–28.01.2022 20.01.2022: 9:30-12:45 (4h) 21.01.2022: 9:30-12:45 (4h) 27.01.2022: 9:30-13:30 (5h) 28.01.2022: 9:30-13:30 (5h)</p>

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