



## PROJECT BEETHOVEN CLASSIC

Continuous flow hydrosilylation in SILP/scCO<sub>2</sub> systems - an innovative approach to reduction and functionalization of alkynes, imines and carbonyl compounds

2 PhD scholarships (2 x 36 months), studies available from October 2020

Adam Mickiewicz University in Poznan, Center for Advanced Technology

Continuous flow hydrosilylation of alkynes, imines and carbonyl compounds

cat@SILP or cat@HPA

scCO<sub>2</sub>

support

Catalytic system

### The proposition of 2 PhD scholarships

in the Center for Advanced Technology and Faculty of Chemistry at Adam Mickiewicz University in Poznan, for carrying out research during 36 (+12) months in the international polish-german project in the framework of BEETHOVEN Classic project financed by the National Science Centre (Narodowe Centrum Nauki).

The scholarships are recommended for **ambitious, young chemists** interested in **catalysis, organometallic and green chemistry** aiming at developing a future scientific carrier in the cooperation with the leading **german University - ITMC RWTH Aachen**. The fellows should possess a good background in catalysis, organometallic chemistry or enantioselective synthesis. They should be able to work in a group, taking initiative and carry out research independently. Good English speaking and writing skills are also expected.

AMU Center for Advanced Technology



Principal investigator:  
**prof. UAM dr hab. eng. Jędrzej Walkowiak**

Institut für Technische und Makromolekulare Chemie  
**ITMC RWTH AACHEN**



Principal investigator:  
**Prof. dr. Walter Leitner**  
Director of MPI for Chemical Energy Conversion in Mulheim, Germany



**Polish - German bilateral project Beethoven Classic**  
UMO-2018/31/G/ST4/04012



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#### SEND E-MAIL TO PI

If you are looking for further information or want to share your CV I will be glad to answer your questions.

[jedrzej.walkowiak@amu.edu.pl](mailto:jedrzej.walkowiak@amu.edu.pl)

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#### RECRUITMENT AT AMU

to the Doctoral School, the scholarships financed from Beethoven Classic project.

Recruitment will be carried out on September 2020.

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#### RESEARCH START

The beginning of the PhD studies and challenging research is planned on the 1<sup>st</sup> of October 2020 in the Beethoven Classic project.



# JĘDRZEJ WALKOWIAK - BEETHOVEN CLASSIC - PHD SCHOLARSHIPS

## The research project objectives

The main goal of the project is to build a new, green strategy in the hydrosilylation of alkynes, imines and carbonyl compounds in continuous flow and repetitive batch systems with the emphasis placed on application of green solvents (scCO<sub>2</sub>, ILs) and catalysts immobilization techniques.

A combination of scCO<sub>2</sub> with the molecular catalyst, its way of immobilization leading to effective separation strategy is responsible for effective hydrosilylation processes. The project will be focused on understanding the process in all its scales: *molecular* (interactions between catalyst, solvent, and reagents), *mesoscale* (development of effective separation strategy) and *macroscale* (the whole process scheme with the inline monitoring of its progress).

The hydrosilylation of alkynes, imines and carbonyl compounds in scCO<sub>2</sub> with the application of catalyst immobilized systems (SILP, HPA) will be carried out for the first time. The catalyst reuse and recycling, easy separation methods of products from the catalyst, as well as the sustainability of the whole process, are the most challenging tasks in modern organosilicon chemistry.

The project work packages are divided between both partners: AMU CAT and ITMC RWTH.



## Selected tasks for PhD students

- Development of new catalytic systems based on TM-catalysts and nanoparticles,
- Effective immobilization of the catalysts (e.g. SILP, HPA)
- Hydrosilylation of alkynes, carbonyl compounds and imines in conventional and green reaction media,
- Carrying out processes using repetitive batch and continuous flow systems,
- Characterization of obtained products with various analytic techniques,
- Synthesis of novel organosilicon compounds (also chiral).

## WHAT ARE WE OFFERING

- A challenging project with high innovative potential in catalysis and green chemistry,
- Working in the international team with cooperation with scientists from RWTH Aachen,
- Excellent facilities and access to the state of the art equipment at CAT AMU,
- Possibilities for self-development and broadening of horizons in various branches of chemistry,
- Possibilities to build your scientific career.

## OUR LATEST PAPERS

*J. Org. Chem.* **2019**, 84, 2358-2365.  
*J. Catal.* **2019**, 376, 219-227.  
*ACS Sustain. Chem. Eng.* **2018**, 6, 10980-10988.  
*ACS Catal.* **2018**, 8, 3297-3303.  
*Adv. Synth. Catal.* **2018**, 360, 2966-2974.  
*J. Catal.* **2017**, 356, 206-213.

## CONTACT

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