

Project 3.17. Development of new pathways for CO₂ utilization

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www: <http://lewin.ch.pw.edu.pl/>

Background:

Carbon dioxide is the most abundant and important C-1 building block in Nature. Simultaneously, the carbon dioxide is one of the most spreading greenhouse gas in the atmosphere. Therefore, there is a great challenge for chemist to developed efficient strategies for direct transformations of CO₂ into useful and value-added products. Nowadays, extremely high investments are dedicated to projects concerning capture, storage and conversion of CO₂ into value-added products. The most promising solutions in this field are the absorption of CO₂ in porous materials, the fixation of CO₂ by organic and inorganic systems, the utilization of CO₂ as C-1 building blocks in organic synthesis and the conversion of CO₂ into unconventional carbon fuels.

Aim:

The proposed project is directed to gain more in-depth understanding of the CO₂ activation and fixation processes by both organic molecules with various N-subunits as well as selected organometallic complexes. The acquired experimental and theoretical knowledge on the CO₂ activation will be exploited for the rational design and synthesis of novel carbonate organic and inorganic building blocks of functional materials.

Requirements:

- a university degree in chemistry,
- experience in laboratory work in the field of inorganic and coordination chemistry and/or semiconductor nanomaterials, experience with the use of a Schlenk line, knowledge of spectroscopic methods (FTIR, NMR i UV-Vis), and basics X-ray crystallography,
- good command in English, communication skills and predispositions to work in a team