

## Student scholarship offer in NSC project at Faculty of Chemical Technology

### Requirements

Student of Chemistry / Materials Science / Biochemistry or a related field.  
Fundamental knowledge of the inorganic and organic chemistry.  
Experience in mechanochemical chemistry  
Knowledge of English language at a level enabling work with scientific publications and presenting results at the international level.  
Knowledge of techniques used for measurements flammability of polymer compositions  
Good work organizational skills, analytical thinking, and self-motivation.  
Experience in FTIR, XRF and NMR analysis  
Knowledge of phytic acid chemistry  
Availability for short-term business trips (domestic and foreign).  
Positive attitude and passion for science.

### Task description

The ultimate goal of this project is to use ionic liquids (ILs) and deep eutectic solvents (DESs) as sustainable reaction mediums for the synthesis of biomineralization-inspired chitin- and collagen-based inorganic-organic hybrid materials. Surprisingly, despite the wide application of ionic liquids as (i) medium in the synthesis of inorganic materials and as (ii) solvents for biopolymers, such an unconventional approach has never been realized before for the synthesis of biomineralization-inspired materials. It is expected that the utilization of these solvents will be game-changing in terms of the synthesis of such materials. The prepared materials are supposed to outperform the natural biominerals in the terms of their properties and in a result will extend possibilities of their practical utilization in the future. This proposal will adopt a truly multidisciplinary and multi-scale approach to answer the fundamental question *"How far ILs and DESs can push the boundaries in bio-inspired materials science?"*

Main research task will be oriented on the on the synthesis of hybrid biomaterials in ionic liquids or deep eutectic solvents as a reaction medium.

Analysis of the collagen, silk, and keratin solubility in selected DESs and ILs.  
Its further processing into scaffolds/membranes using electrospinning technique.

Characterization of obtained materials with respect to their morphology, mechanical and physicochemical properties. Finally, application of prepared materials as sorbents for neutralization of selected environmental hazards.

Active participation in preparation of the scientific articles and results dissemination at international conferences.

Application deadline: 2023-02-24 12:00

Selection deadline: 2023-02-28

### Employment conditions

Student will receive a stipend in the amount of 2500 PLN /month from funds of the above-mentioned project

Other benefits:

- additional funds for participation in conferences, research visits, and courses.
- starting date of employment: 03.03.2023

### Additional information

Applications consisting of:

- cover letter,
- academic curriculum vitae,

should be sent to: marcin.wysokowski@put.poznan.pl