

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

### Requirements:

- MSc in Chemistry / Materials Science / Biochemistry or a related field.
- Fundamental knowledge of the inorganic and organic chemistry.
- Fundamental knowledge of analytical techniques used for materials characterization (XRD, SEM, TEM, AFM, IR).
- Knowledge of English language at a level enabling work with scientific publications and presenting results at the international level.
- Good work organizational skills, analytical thinking and self-motivation.
- Experience in the SDS-PAGE or electrospinning is welcome.
- 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. Their further processing into scaffolds/membranes using electrospinning technique. Synergistic integration of computational modeling and experimental fabrication toward predictive synthesis of bioinspired materials - in collaboration with Massachusetts Institute of Technology (USA). Characterization of obtained materials with respect to their morphology, mechanical and physicochemical properties. Finally, application of prepared materials as a non-enzymatic sensor, tissue engineering scaffolds or membranes for neutralization of environmental pollution.

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

Application deadline: 2022-07-31 12:00

Selection deadline: 2022-08-08

### Scholarship conditions

Ph.D. students will receive a stipend in the amount of 2375 PLN gross/month until obtaining a positive mid-term evaluation; 3654 PLN gross after obtaining a positive mid-term evaluation (financed from the funds of the above-mentioned project for a period of 29 months).

Other benefits:

- short visits at the Massachusetts Institute of Technology, USA
- additional funds for participation in conferences, research visits, etc.
- starting date of employment: 03.10.2022

### Additional information:

Applications consisting of:

- cover letter,

- academic curriculum vitae,

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