DOCTORAL STUDENT POSITION FUNDED BY NATIONAL SCIENCE CENTRE (POLAND)
PRELUDIUM-BIS GRANT

The Department of Physical Chemistry and Technology of Polymers of the Faculty of Chemistry at the Silesian University of Technology in Gliwice, Poland is seeking a candidate for a doctoral student position in the framework of a PRELUDIUM-BIS programme project "*New spin concentration standards for Electron Paramagnetic Spectroscopy based on doped π-conjugated polymers*" funded by the National Science Centre of Poland.

Project outline:

Doped polyaniline is being put forward as a versatile, tuneable and durable π-conjugated polymer material for a new polaronic EPR spin standard. Cheap raw starting material (aniline), facile chemical synthesis (acidic oxidative polymerisation) amenable to broad array of modifications (choice of doping acid) of the target polymeric product, together with empirically well-established environmental stability of its doped form, all make doped polyaniline a promising candidate to develop an EPR standard material closely matching the spin environment of doped π-conjugated semiconductors. This project constitutes a scientific endeavour to formulate precise synthetic methodology towards reproducible preparation of polyaniline samples with bespoke doping level, qualitatively and quantitatively characterise the magnetic properties of spin population of such prepared materials, identify potential chemical or physical factors modifying those properties, and fashion prototype standard samples subjecting them to long-term durability tests. If successful, the new EPR spin standard could become an indispensable aid for precise quantitative characterisation of the doping process of hitherto and future organic semiconducting materials.

Doctoral student's duties:

The Doctoral student will commence education at the Joint Doctoral School of the Silesian University of Technology, starting from the academic year 2022/23, the scientific element of which will be the implementation of the research project entitled: "*New spin concentration standards for Electron Paramagnetic Spectroscopy based on doped π-conjugated polymers*", funded under the PRELUDIUM-BIS 2 call.

Duties of the Doctoral student, will involve:

- Completion, during the period of engagement in the project, of the full study program of the Joint Doctoral School of the Silesian University of Technology, followed by obtaining the doctoral degree no later than 12 months after the project completion date;
- Implementation of an individual doctoral school research plan, consistent with the research project plan being carried out;
- Keeping up to date with developments in the research field of the project through regular literature survey updates;
- Experimental scientific work, including:
  - Synthesis of selected π-conjugated polymers by chemical methods;
  - Analysis of the composition of the obtained doped polymers with instrumental techniques;
  - Investigation of physicochemical properties of the obtained polymeric materials by spectroscopic methods, using Electron Paramagnetic Resonance spectroscopy in particular;
  - Development of procedures for obtaining π-conjugated polymers with reproducible concentration of paramagnetic centres;
  - Studies of electron spin dynamics in the prepared spin standard materials;

  - Identification of the influence of environmental factors on the number and properties of paramagnetic centres in the developed spin standard materials at different time intervals;
- Interpretation of the obtained results and making first decisions about further directions of experimental work;
- Collaborating with the project leader in implementing the research plan and achieving the project's goals;
- Preparation of reports of the research work carried out;
- Preparing drafts of manuscripts of scientific publications in English;
- Presentation of the obtained results at scientific conferences.
- Applying for funding of a six-month foreign internship in a call organised by the Polish National Agency for Academic Exchange (NAWA) terms of which are specified in Annex 1 to the cooperation agreement between NAWA and the National Science Centre of Poland concluded on the 12th of September 2019, and after obtaining funding for it, completing this internship during the project.
- Preparation of a doctoral dissertation based on the research results obtained during implementation of the project;

Application requirements:

Formal:

Eligible applicants must not hold a doctoral degree, nor be enrolled at any doctoral school. Details about candidate requirements and the application procedure in this call can be found at the website of the electronic recruitment platform of the Silesian University of Technology at: https://rekrutacja.polsl.pl/jdsmain/ and https://irk.polsl.pl/en-gb/home/REK2022_2023_WSD/ in particular:

- Basic information: https://rekrutacja.polsl.pl/jdsmain/
- Recruitment calendar: https://rekrutacja.polsl.pl/jsdharmeng/
- How to apply: https://www.polsl.pl/rjo15-sd/en/how-to-apply/
- Required documents: https://rekrutacja.polsl.pl/jdsdocuments/
- Admission criteria: https://rekrutacja.polsl.pl/jsdadmisscrit/
- Initial concept of doctoral dissertation: https://rekrutacja.polsl.pl/wp-content/uploads/2020/06/Initial-concept.pdf

Project specific:

- Graduate degree in the field of chemistry, or physics, entitling the applicant to pursue a doctoral degree in the country the graduate degree has been issued in;
- Knowledge of the topics of:
  - chemistry of radicals;
  - redox reactions;
  - interaction of electromagnetic radiation with matter;
  - spectroscopic techniques;
- Experience in working with scientific equipment;
- Diligence, meticulousness, and good organisational skills;

- Ability to critically evaluate the results obtained;
- Resourcefulness, motivation and commitment to research work.
- Ability to work individually, and in a team;
- Good active and passive command of the English language.

Application submission deadline:

5th of September 2022; 23:59 CEST.

Modes of submitting applications:

Recruitment documents should be submitted via the electronic recruitment platform of the Silesian University of Technology at: https://irk.polsl.pl/pl/profile/applications/ by selecting "*Chemical Sciences*" discipline, and the "*New spin concentration standards for Electron Paramagnetic Spectroscopy based on doped π-conjugated polymers*" doctoral project. The applicant is required to create a user profile on the website and provide detailed personal data and data regarding his/her education. Complete set of documents, in electronic form, must be submitted before the deadline. Incomplete submissions will become inactive after the deadline, and will not be considered.

Terms of engagement:

- Doctoral studies at the Joint Doctoral School of the Silesian University of Technology under the scientific supervision of the head of Preludium-Bis project;
- Preludium-Bis doctoral scholarship contract for a specified period of 48 months;
- Monthly gross scholarship of 5000 PLN, up to the month of the mid-term evaluation of the Doctoral student, and 6000 PLN, after the month of the mid-term evaluation of the Doctoral student.
- Starting date: 1st of October 2022 (foreign laureates applying for a Polish visa: 1st of January 2023)

Additional information:

Candidates will be assessed in accordance with the recruitment procedure of the Joint Doctoral School of the Silesian University of Technology (https://rekrutacja.polsl.pl/jsdadmisscrit/) and, in parallel, the competition procedure specified in the Regulations on awarding funds for the implementation of research project tasks financed by the National Science Centre of Poland, hereinafter referred to as the Regulations, the uniform text of which is attached to the Resolution of the Council of the National Science Centre No. 95/2020 of September 14, 2020., in particular Annex 2 to the above-mentioned Regulations, i.e. Costs in research projects, hereinafter referred to as the "Catalogue of eligible and non-eligible costs", version valid as of 15th of September 2020. (https://ncn.gov.pl/sites/default/files/pliki/uchwaly-rady/2020/uchwala95_2020-zal1.pdf#page=49) Only the winner of both procedures - recruitment and competition, will become the successful laureate.

Recruitment interviews with the candidates will be held between the 12th and 28th of September 2022.

Questions regarding the recruitment procedure should be directed to: Doctoral School Admissions Office (study@polsl.pl), Ms Katarzyna Samsonowicz at: katarzyna.samsonowicz@polsl.pl (doctoral school), whereas questions regarding the competition procedure should be sent to: Mr Wojciech Domagala, D.Sc. Ph.D. at: wojciech.domagala@polsl.pl (head of the project).