



Institute of Molecular Physics
Polish Academy of Sciences
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**Recruitment for the Ph.D. position in PRELUDIUM BIS 3 Research Project
and for the Poznan Doctoral School of the Institutes of the Polish Academy of Sciences
at the Institute of Molecular Physics, PAS in Poznan
Procedure No. 35/2022/IFM/PSD**

Institution: Institute of Molecular Physics Polish Academy of Sciences (IMP PAS)
City: Poznań, Poland
Position: Ph.D. student
Positions available: 1
Scientific discipline: physics
Publication date: 29 July 2022.
Application deadline: 16 September 2022; 15:00 CEST
IMP PAS website: <https://www.ifmpan.poznan.pl>
PDS website: <https://www.ifmpan.poznan.pl/BIP/index.php/edukacja/psd-ipan>

RESEARCH PROJECT OFFER:

Research topic: *Supramolecular ionic systems as solid electrolytes: from design to applications in lithium-ion materials*

Keywords: solid-state physics, soft matter, renewable ionic conductors, applied physics.

Research group: Department of Nuclear Magnetic Resonance (Z8)

Principal Investigator: dr hab. inż. Michał Bielejewski, prof. IFM PAN

Project description:

The project aims to develop a new generation of flexible and thermally renewable solid electrolytes and understand the lithium-ion transport mechanism and intermolecular interactions in the produced systems. The motivation to undertake the above research is the search for new ionically conductive materials for applications in lithium-ion systems characterized by a renewable internal structure. The above inquiries are caused by the necessity to develop technologies that actively contribute to the protection of the environment (renewable internal structure of the stabilizing matrix) and exhibit high performance with a reduction or complete abandonment of polymer fractions. The obtained results will indicate milestones in developing a new generation of high-performance solid electrolytes with a minimized environmental impact. Project members are working closely with partners from the Department of Physical Chemistry of the Royal Institute of Technology KTH in Stockholm, Sweden, where the pioneering research on lithium-based ion gels using the electrophoretic nuclear magnetic resonance (eNMR) technique will be conducted.

Research objectives:

The project focuses on the creation and characterization of ionically conducting soft matter systems, the carrier of which will be various forms of lithium. To create the system matrix, molecules with small molecular weights capable of gelling ionic systems, the so-called low molecular weight gelators, will be



used. Unique mechanical properties will also characterize the investigated ionic systems: while maintaining flexibility, they will have the ability to renew the internal structure, which will allow them to extend their lifetime and quickly repair damaged matrices. Understanding the mechanisms of lithium-ion transport and intermolecular interactions between lithium ions and the gelator matrix in the produced supramolecular systems will allow for solid electrolytes' conscious and purposeful design. The project also involves conducting pioneering research in this aspect using the electrophoretic nuclear magnetic resonance (eNMR) method in one of the leading research centers in Europe (KTH Royal Institute of Technology, Stockholm, Sweden) during a 6-month research internship. An additional goal will be to determine the thermal properties of the produced solid electrolytes and characterize the phase transitions occurring in them, emphasizing the reversible gel-sol-gel phase transition. The most promising chemical composition and supramolecular structure systems will be subjected to application tests to determine their application potential.

Additional information:

1. Research and the doctoral thesis will be carried out within the PRELUDIUM BIS 3 project *Supramolecular ionic systems as solid electrolytes: from design to applications in lithium-ion materials* no. UMO-2021/43/O/ST5/01911, funded by the National Science Center;
2. Ph.D. students shall receive a stipend in the gross amount of 5.000,00 PLN till the month of mid-term assessment and in the amount of 6.000,00 after the month when the mid-term assessment will be performed (the period of receiving the scholarship is 48 months);
3. The Ph.D. student will be covered with the costs of social insurance pursuant to Article 6(1)(7b) and Article 12(1) of the Act of 13th October 1998 on the social insurance system (Journal of Laws of 2019, item 300, as amended), in accordance with the principles described below:
 - a. Social security contributions are co-financed by the Ph.D. student (insured) and the Institute of Molecular Physics of the Polish Academy of Sciences (payer).
 - b. The pension insurance contribution is financed in equal parts by the insured and the payer from their own resources, 9.76% of the calculation base each.
 - c. The disability pension insurance premium is financed by the insured person in the amount of 1.5% of the calculation base and 6.5% of the calculation base of the payer.
 - d. The insured person's sickness insurance contribution is financed entirely from his own resources.
 - e. The accident insurance contribution for doctoral students is financed entirely from the payer's own funds.

Requirements for candidates:

1. M.Sc. degree in physics or related sciences, or fulfilling the conditions stipulated in article 186, section 2 of the act of 20th July 2018 Law on Higher Education and Sciences (Journal of Laws of 2018, item 1668, as amended);
2. The candidate cannot hold the doctoral degree and be a participant in the doctoral school before entering the competition;
3. The candidate is obliged to complete the education program at the doctoral school, which will end in obtaining the doctoral degree within 12 months of the completion of the PRELUDIUM BIS 3 project;
4. Knowledge in the field of solid-state physics and soft matter systems as well as basic skills in analytical chemistry;
5. Experience in the field of solid-state physics, properties of soft matter systems, and basic analytical methods used in physics;
6. Ability to use programs supporting research, for example, OriginLab, MestreNova, spreadsheet, etc.;
7. Commitment, critical thinking skills, and problem-solving abilities;

8. High motivation for further development, communication skills, and ability to work in a team and individually (the Ph.D. student will carry out a 6-month internship abroad);
9. Fluency in English (both in speech and writing) on the level of B2-C2;
10. Skills that will be an advantage of the applicant: extended knowledge of the subject of self-organizing soft matter systems, ionic conductivity processes, and related experimental methods;

Job benefits:

- 6 months of Internship at Royal Institute of Technology KTH, Stockholm in Sweden;
- additional funds for participation in conferences and scientific schools;
- additional funds for tools necessary for the implementation of the project (laptop, external drive, etc.)
- work in a young active team;

Expected date of employment start: 1st October 2022

Required documents:

1. Application for admission to Poznań Doctoral School of the Institutes of the Polish Academy of Sciences (PDS IPAS) along with the consent for processing personal data upon the recruitment procedure and a statement on having acknowledged the regulations of recruitment for PDS IPAS, using the form downloaded from:
<https://www.ifmpan.poznan.pl/BIP/edukacja/psd-pan.html?task=article.downloadAttachment&id=317&version=867>
2. Certified copy of the diploma confirming graduation or a certificate confirming graduation (in the case of diplomas issued by foreign higher education schools, diploma stipulated in article 326, section 2, passage 2 or article 327, passage 2 of the act of 20th July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended), entitling to apply for conferment of a doctoral degree in the state in where the relevant higher education school-issued such a certificate. In the event that the candidate does not have the aforementioned documents, he/she is obliged to submit them before admission to PDS IPAS. Additional information on foreign school diplomas is available at <https://nawa.gov.pl/en/recognition/recognition-for-academic-purposes/applying-for-admission-to-doctoralstudies>;
3. Scientific CV encompassing track record of previous education and employment;
4. A cover letter featuring a short description of research interests, scientific accomplishments, a list of publications, information on involvement in scientific activity (membership of student scientific groups, participation in scientific conferences, completed internships and training courses, prizes and distinctions received), and reasons for wishing to study at the doctoral school;
5. Certificates or other documents confirming the degree of proficiency in English, if the candidate owns such materials;
6. Consent for the processing of personal data for recruitment purposes (Appendix 1);
7. Contact details of at least one previous scientific supervisor or another researcher who is entitled to issue an opinion on the candidate.

Documents in languages other than Polish or English should be translated into Polish or English.

Applications should be submitted electronically to the e-mail address office@ifmpan.poznan.pl with the subject of the message "*Competition for the Ph.D. position No. 35/2022/IFM/PSD*" as the attachment in the pdf file format.

Alternatively, if the electronic delivery is not possible, applications can be sent to the postal address of the Secretariat of the Institute of Molecular Physics, Polish Academy of Sciences.

ul. Mariana Smoluchowskiego 17, 60-179 Poznan, Poland



with an annotation on the envelope: " *Competition for the Ph.D. position No. 35/2022/IFM/PSD*".

Please do not send the originals of the documents.

Recruitment Procedure:

Recruitment will take place in two stages. Based on the comparison of applications, the competition for the Ph.D. position in the PRELUDIUM BIS 3 Project will be decided in the first stage. To start working on the PRELUDIUM BIS 3 project, the candidate is obligated to admission to the Doctoral School. The highest-ranking candidates will be invited to a videoconference interview. The candidates will be informed at least 7 days before the planned interview.

Criteria for evaluation of candidates for Ph.D. position in Preludium Bis 3 project:

The scholarship will be awarded in accordance with the NCN regulations. The Commission will take into account the following criteria:

- competences of candidates for specific tasks in a research project (70 % of the final grade);
- previous scientific achievements of candidates, including publications in the renowned publishers/scientific journals (30 % of the final grade).

The scholarship will be awarded to the person who obtains the highest number of points. If the top candidate does not sign the contract, we reserve the right to choose the next candidate from the ranking list due to the resignation.

Criteria for evaluation of candidates for Doctoral School:

1. Candidate's research achievements, according to the grades obtained in the course of studies, scientific publications, awarded scholarships, and distinctions resulting from conducting scientific research or student activities or other achievements;
2. Candidate's scientific and professional experience, according to participation in conferences, workshops, training sessions, and internships, implementation of research and commercial projects, involvement in scientific trusts and societies, international and professional mobility, experience in other sectors, including industry;
3. Candidate's knowledge of the following discipline: physical sciences;
4. Knowledge of the subject matter described in the recruitment advertisement.

The recruitment procedure shall be concluded until 26th September 2022.

The description of the recruitment process for Doctoral School is stipulated in the Regulations of Recruitment for PDS IPAS. Following the recruitment procedure, the unadmitted candidates shall be informed about the scores obtained at various stages of the recruitment process.

For additional information, don't hesitate to get in touch with the Principal Investigator of the PRELUDIUM BIS project:

dr hab. inż. Michał Bielejewski, prof. IFM PAN
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tel.: +48 (0)61 8695216

The Institute of Molecular Physics Polish Academy of Sciences, does not provide accommodation.

PRINCIPAL INVESTIGATOR

dr hab. inż. Michał Bielejewski, prof. IFM PAN

DIRECTOR

prof. dr. hab. Zbigniew Trybuła



Information clause:

According to the content of art. 13 of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27th April 2016 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46 / EC (General Data Protection Regulation), hereinafter referred to as GDPR, we inform that:

1. The administrator of the collected personal data is the Institute of Molecular Physics of the Polish Academy of Sciences, Mariana Smoluchowskiego 17, 60-179 Poznan, Poland, VAT No. PL 777-00-20-870 (hereinafter referred to as the Institute).
2. The administrator has appointed a Data Protection Inspector who can be contacted in writing, by traditional mail, writing to the Institute's address: Data Protection Inspector, Institute of Molecular Physics of the Polish Academy of Sciences, Mariana Smoluchowskiego 17, 60-179 Poznan, Poland or by sending an e-mail to iod@ifmpan.poznan.pl.
3. Personal data are processed to implement the administrator's tasks related to the recruitment to the Poznań Doctoral School of the Institutes of the Polish Academy of Sciences.
4. The legal basis for data processing is the Act of 26th June 1974 - Labor Code, the Act of 30th April 2010 on the Polish Academy of Sciences, the Act of 20 July 2018 Law on Higher Education and Science, and consent of the data subject.
5. Personal data collected in the current recruitment process will be stored for three months from the moment the recruitment process is resolved. After this period, personal data will be effectively destroyed.
6. Personal data will not be conveyed to a third country.
7. Personal data of the candidate selected in the competition may be made available to third parties authorized under the law.
8. The person whose data is processed has the right to:
 - access to the content of your personal data, demand their correction or deletion, on the terms set out in art. 15-17 GDPR;
 - set restrictions on data processing, in cases specified in art. 18 GDPR;
 - data transfer, on the principles set out in art. 20 GDPR;
 - withdrawal of consent at any time without affecting the lawfulness of the processing that was carried out based on consent before its withdrawal;
 - lodging a complaint to the President of the Office for Personal Data Protection.

Providing personal data in the scope resulting from art. 22 (1) of the Act of 26th June 1974 - Labor Code, is mandatory, providing data in a broader scope is voluntary and requires consent to their processing. Refusal to provide personal data prevents the application from being considered.

Appendix 1

Consent for the processing of personal data for recruitment purposes

I agree to the processing of personal data provided in this document for realising the recruitment process pursuant to the Personal Data Protection Act of 10th May 2018 (Journal of Laws 2018, item 1000) and in agreement with Regulation (EU) 2016/679 of the European Parliament and of the Council of 27th April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).

Name

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Date and signature