

Draft Fact sheet Ukraine ESYMAT

Centre: **Universidad CEU San Pablo**

Group: **Solid state and materials chemistry**

ESYMAT <https://www.uspceu.com/en/research/research-groups/id/esymat>

School of Pharmacy

Contact: Prof. Mr. Flaviano García Alvarado flaga@ceu.es

Description:

Universidad CEU San Pablo, non-profit educational institution, was created by the Catholic Association of Propagandists and which has been for more than 80 years focusing on training humanly, academically, and professionally students, in order for them to acquire the necessary competences to occupy positions of prominence, both in the national and international field.

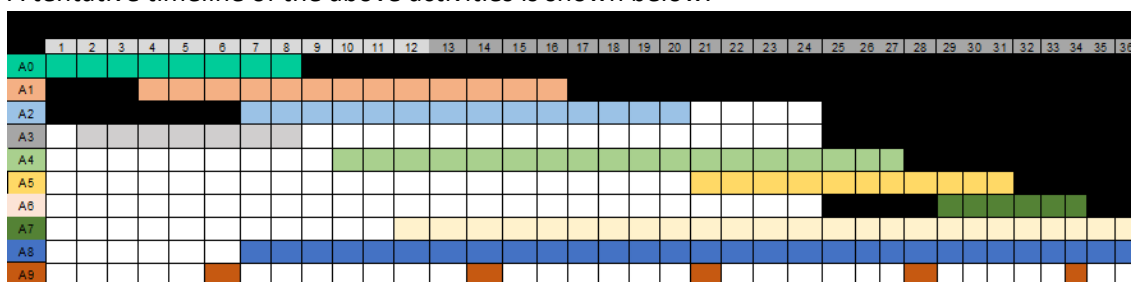
Functions:

The working plan foreseen for the post-doctoral researcher coming from Ukraine would fall within the framework of the projects currently underway within the group.

- I) To increase research productivity and impact through mobility by providing different expertise including for example XPS, computational chemistry of solids, impedance spectroscopy, XAS, transmission electron microscopy, and other within the field of solid state and materials chemistry.
- II) To increase the training capacity when incorporating such new capacity to research projects of the different doctoral students.
- III) To promote, through its network of collaborators, participation in European and international projects with new partners who can in turn contribute new skills and resources. The project to be developed in the USP will lead to the opening of a new line of research on the synthesis, characterisation and testing of new materials for sodium, magnesium or potassium batteries, i.e. batteries that do not use lithium. The scarcity of lithium recommends exploring different, more sustainable and inexhaustible chemistries such as these batteries. At the same time, the current trend towards sustainable chemistry would place this Project in the priority lines both Governments of the Autonomous Community of Madrid and of the State and the European Commission. Also, the acquisition of experience in these chemistries would be of added value for the application for European and international aid.
- IV) In particular, the objective of the project would be the synthesis and characterisation of new materials for post-lithium (sodium ion, magnesium or potassium) batteries. Thus, the following tasks or actions are proposed **(An)**:
 - Analysis by computational methods of possible lamellar/laminar oxides that can intercalate large ions **(A0)**.
 - Synthesis of lamellar oxides that present a topology suitable for the insertion of large ions **(A1)**.

- Structural and morphological characterisation of prepared oxides by techniques available in Universidad San Pablo CEU and those that can be accessed through the network of collaborators (Integrated National Research Project), as well as through applications to access large European facilities in which the ESYMAT group is a frequent user **(A2)**.
- Adaptation of infrastructure of the ESYMAT group of Universidad San Pablo CEU to facilitate the analysis of such materials by means of new techniques in which post-doctoral researchers may be an expert **(A3)**.
- In the event that such infrastructure was economically unaffordable or not allowed by timeline, external services will be used, such as Central Services Research Support (SCAI) - University of Málaga (XPS photoemission spectroscopy, BET textural analysis, SAXS low-angle X-ray diffraction) or the Spanish National Centre for Microscopy for HRTEM high-resolution microscopy, and elemental analysis by WDS microprobe.
- Assessment of the electrochemical properties of such materials in sodium, magnesium or potassium half-cells **(A4)**.
- Based on performance, the interest of assembling full cells will be assessed and the cells will be assembled and characterised **(A5)**.
- The electrochemical performance of the complete cell would be communicated to Mindcaps company, a member of Phi4Tech Group (<https://www.phi4tech.com/>) after the signature of the appropriate MoU to facilitate the transfer of technology **(A6)**.
- During the course of the projects, different national, European and international calls for proposals with the partners of Universidad San Pablo CEU will be made, after their analysis, together with the possible contacts or partners that the Postdoctoral researcher can provide **(A7)**.
- The researcher will also participate in activities to disseminate and protect research, both in the scientific field (publications and patents if necessary) **A8**
- and to Society (Science Week, European Researchers' Night, etc.) **A9**.

A tentative timeline of the above activities is shown below.



Subject: POTENTIAL TEACHING OF PRACTICAL OR THEORETICAL LESSONS IN THE SUBJECTS OF General Chemistry, Chemical Experimentation, and Inorganic Chemistry.

Reception of CVs: 30 working days since the publication on the University's website of expressions of interest from the recognised research groups.

Location:

Montepríncipe Campus

Madrid

Country:

Spain

Requirements: PhD researchers, of Ukrainian nationality, and that are attached to research universities or centres based in Ukraine.

Required education:

- Bachelor's Degree in Chemistry, Chemical Engineering, Materials Science
- Doctorate in Inorganic Chemistry, Chemical Physics, Electrochemistry, Materials Science, Solid State Physics

Work experience:

- Teaching experience in the area of General Chemistry or Inorganic Chemistry
- Research experience: Solid State Chemistry, Energy Materials and Electrochemistry

Languages:

- B2-C1/C2 English

Competences and skills:

- Teamwork
- Laboratory practice

The following is offered:

- Postdoctoral research contract at Universidad San Pablo-CEU, in accordance with Spanish legislation and, in particular, the contractual modalities foreseen in Spanish Act 14/2011, of 1 June, on Science, Technology and Innovation and in the XIII state-wide collective agreement for the university education and research centres. **The contracts shall last for a maximum of three years.**
- Aid for travel and installation expenses in Madrid: an additional grant of 1.500 euros provided by the University to the beneficiary as soon as the contract has been signed as a postdoctoral researcher and that is aimed at supporting the beneficiary for expenses incurred as a result of the beneficiary's travel and installation in Spain.

b. To obtain the University and the research group's collaboration and support necessary to develop the research work involved in their incorporation programme normally.

c. To benefit from the intellectual and industrial property rights that correspond and come from the research activity, in accordance with the, both internal to the University and public, current legislation and regulations.

d. To use the services offered by the University and to participate in in all its activities in accordance with internal regulations.

e. To apply for external call for grants for research actions.

Part-time teaching at Montepíncipe Campus

First semester of the academic year 22/23

Working hours:

Full-time