

Job Title: Research Associate (AlCaDES Project)
Grade: 7
Salary: £39,906 to £46,049 per annum
Department: Chemical, Environmental and Earth Science
Hours/Contract: Full time or job share considered, Fixed term until 31/03/27
Job Family: Teaching and Research
Reference: 13653

Role Purpose

This project is sponsored by the Faraday Institution and addresses challenges associated with aqueous rechargeable aluminium battery anodes. Many approaches to control the aluminium anode / electrolyte interface in aqueous rechargeable aluminium metal batteries (ARAMB) have focussed on the depassivation of the aluminium foil by pre-treating it in a separate liquid electrolyte. This approach can also form an SEI layer that protects the aluminium metal from free water during operation in the electrolyte and also greatly slows the rate of competitive hydrogen evolution (HER). Both of these factors are key to the function of the ARAMB. Previous approaches have used either conventional ionic liquids such as imidazolium/ AlCl_3 melts which are very expensive, or else ionic liquid analogues based on mixtures of AlCl_3 with components such as acetamide or urea. The latter are cheap and quite effective, but the SEI formed is not very stable. Hence the challenge addressed here is to develop a cost-effective process combining pretreatment and operational aqueous electrolyte for a stable SEI during cell cycling.

Main Duties and Responsibilities

Research

- To undertake a specific role in a research project, taking responsibility for sample preparation, cell-testing and analysis using a variety of electrochemical, thermal, mechanical, spectroscopic and microscopic techniques. Working with other members of the team to prioritise experiments and attain project objectives and milestones.
- To contribute to the development of the choice of techniques, critiques, approaches, models and methods
- To contribute to the overall research programme using innovative research models, novel approaches and techniques.
- Effective liaison and reporting to PI, other project partners and project administrator.
- Management of all laboratory facilities to ensure efficient progress towards project goals and compliance with Health and Safety regulations.
- To lead in writing up research findings for dissemination amongst the research team and broader international community, and develop ideas and contributions for future grants, technical outputs.
- To represent the research group by disseminating results/findings at national and international conferences and broader community, including industrial collaborators.





- To contribute to research outputs as a co-author to journal articles, technical papers, monograph, book chapter.
- To provide guidance to other staff and students (involved in the research programme).

Professional Development

- Duties and opportunities to engage in work that support your own professional development.

Impact and Knowledge Exchange

- Network and contribute to the maintaining and furthering of the wider research programme and research area
- To contribute to industry and other partner collaborations
- To engage positively and pro-actively in research impact

Leadership and Citizenship

- Guidance to other team members both research staff and students
- Pro-actively build networks and collaborations.
- Providing mentoring and coaching to Early Career Researchers and research students.

Internal and External Relationships

- Frequent (at least weekly) meetings with PI and relevant research associates/researchers to decide priorities and tasks to meet project goals.
- 3-weekly reporting (written and telecon) to partners.
- Monthly meetings with other partners.

Planning and Organising

- Day to day management of undergraduates as well as own workload to ensure project keeps on schedule.
- In collaboration with PI plan the development of the project, including budgeting, on timescales from weeks to months.

Qualifications, Knowledge and Experience

Essential

- PhD or equivalent in electrochemistry and physical chemistry of chloroaluminate electrolytes.
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- Knowledge/Experience relating to chloroaluminate battery design and function. *
- Experience with design/function relating to in-operando spectroscopy of chloroaluminate systems, especially Raman, or XAFS. *
- Some experience of management of a laboratory and the supervision and support of students. *

Desirable

- Experience of writing scientific papers
- Experience of developing and protecting IP for the University and industrial partners.

Skills, Abilities and Competencies

Essential

- Handling and preparation of air-sensitive materials including chloroaluminate liquids, gels and eutectics. *
- Anaerobic glove-box technique and maintenance. *
- Analytical and technical/scientific problem-solving capability. *
- Well-developed understanding of Health and Safety regulations and procedures
- Ability to work well with and motivate a team. *
- Ability to prioritise and work to deadlines

Desirable

- Good oral and written communication skills
- Leadership skills

****Criteria to be used in shortlisting candidates for interview***

Reason for Fixed Term Contract

The reason for the fixed term contract is stated in section 1.9 in the summary of contractual terms in your contract of employment.

Criminal Declaration

If you become an employee, you must inform your manager immediately, in writing, if you are the subject of any current or future police investigations/legal proceedings, which could result in a criminal offence, conviction, caution, bind-over or charges, or warnings.

Supporting University Activities





As a University of Leicester citizen, you are expected to support key university activities such as clearing, graduation ceremonies, student registration and recruitment open days. We expect all staff as citizens to work flexibly across the University if required.

University Values

Inclusive - We are diverse in our makeup and united in ambition. Our diversity is our strength and makes our community stronger.

Inspiring - We are passionate about inspiring individuals to succeed and realise their ambitions. We challenge our community to think differently, to get involved, and to constantly embrace new ideas.

Impactful - As Citizens of Change we will generate new ideas which deliver impact and empower our community

Freedom of Speech

The University is committed to upholding freedom of speech and academic freedom within the law throughout our recruitment processes. We ensure that all candidates are considered based on merit and suitability for the role, without regard to their lawful viewpoints or the expression of challenging or controversial ideas. Our recruitment policies and practices are designed to protect applicants from discrimination or adverse treatment on the basis of their opinions, and to foster an environment where open debate and diverse perspectives are valued as essential to our academic mission.

Equity and Diversity

We believe that equity, diversity and inclusion is integral to a successful modern workplace. By developing and implementing policies and systems that challenge stereotypes across all aspects of our work, we have a culture that recognises and values the diverse contributions of our staff which benefits everyone. Our strong values of inclusivity and equity support our efforts to attract a diverse range of high quality staff and students, and identify our University as a progressive and innovative workplace that mainstreams equity, diversity and inclusion.

