



UNIVERSITY OF LEEDS

## CANDIDATE BRIEF

**Research Fellow in Synthesis of Ligands for the Extraction of Uranium and Minor Actinides, Faculty of Engineering and Physical Sciences**



**Salary: Grade 7 (£39,105 - £46,485 p.a.)**

**Reference: EPSPE1120**

**Location: Leeds main campus**

**Closing date: Sunday 09 March 2025**

**Fixed-term for 12 months**

**We are open to discussing flexible working arrangements**

## **Research Fellow in Synthesis of Ligands for the Extraction of Uranium and Minor Actinides, School of Chemical and Process Engineering.**

**Are you an experienced and ambitious researcher looking to tackle one of the UK's biggest challenges? Do you have an interest in developing a commercial system for fusion reactors? Do you want to further your career in one of the UK's leading research-intensive Universities?**

This project is part of a new EU programme TRANSPARANT (Technological Research Action Necessary for Safe PARtitioning And Nuclear Transmutation). The project will support researchers across the consortium by providing a supply of ligands for separation of uranium and minor actinides.

Work completed, at the University of Leeds, as part of a PhD project, developed efficient manufacture routes for complex, high-interest organic ligands such as the malonomides, diglycolamides, and bis-1,2,4-triazinyl-2-2'-bipyridines (BTBPs). Of specific interest was the monoamide DEHiBA (N,N-di-(2-ethylhexyl) isobutyramide), which is an exciting ligand for the advancement of nuclear reprocessing. DEHiBA offers the capability to selectively extract uranium devoid of plutonium, providing proliferation resistance and access to a replacement process for PUREX.

Another ligand of specific interest to researchers on TRANSPARANT, is the "CHON" compatible, water-soluble ligand 3,3'-(pyridine-2,6-diylbis(1H-1,2,3-triazole-4,1-diyl))bis(propan-1-ol) (PTD), which has shown promise for selectively stripping actinide ions from an organic phase containing both actinide and lanthanide ions.

This project will focus on PTD. The synthesis routes available will be reviewed and a set of experiments will be designed to determine an optimised set of conditions for the most economic route that will be related to full scale production. The route will then be tested by producing PTD ligand for supply to other partners for use in their experiments. Depending on the cost of raw reagent, up to 250mL of purified ligand will be produced.

The project will last for 12 months and will require on-campus working.



## What does the role entail?

As a Research Fellow, your main duties will include:

- Operating laboratory scale rigs and working with modellers to cross link data for validation purposes;
- Generating independent and original research ideas in the appropriate subject area;
- Developing research objectives and contributing to setting the direction of the research project and team including preparing proposals for additional funding in collaboration with colleagues;
- Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own research;
- Making a significant contribution to the dissemination of research results by publication in leading peer-reviewed journals and by presentation at national and international meetings;
- Working independently and as part of a larger team of researchers, both internally and externally, to develop new research links and collaborations and engage in knowledge transfer activities where appropriate;
- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

## What will you bring to the role?

As a Research Fellow, you will have:

- A PhD (or have submitted your thesis before taking up the role) in a relevant engineering or physical science subject;
- A strong background in laboratory and/or pilot scale synthesis or use of organic ligands for nuclear energy applications;
- A strong background in the use of statistical experimental design techniques and associated software packages;



- Evidence of involvement in experimental research projects on solvent extraction;
- Good time management and planning skills, with the ability to meet tight deadlines and manage competing demands effectively without close support;
- A developing track record of peer-reviewed publications in international journals;
- Excellent communication skills both written and verbal, and the ability to communicate your research at national and international conferences;
- A proven ability to work well both individually and as part of a team;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience of pursuing external funding to support research.

## How to apply

You can apply for this role online; more guidance can be found on our [How to Apply](#) information page. Applications should be submitted by **23:59** (UK time) on the advertised [closing date](#).

## Contact information

To explore the post further or for any queries you may have, please contact:

[Associate Professor David Harbottle](#)

Email: [D.Harbottle@leeds.ac.uk](mailto:D.Harbottle@leeds.ac.uk)

## Additional information

### Faculty and School Information

Further information is available on the research and teaching activities of the [Faculty of Engineering & Physical Sciences](#), and the [School of Chemical and Process Engineering](#).



## **Working at Leeds**

We are a campus-based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our [Working at Leeds](#) information page.

## **A diverse workforce**

As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Engineering and Physical Sciences we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

The Faculty of Engineering and Physical Sciences are proud to have been awarded the Athena SWAN [Silver](#) Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our [equality and inclusion webpage](#) provides more information.

## **Information for disabled candidates**

Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found under the 'Accessibility' heading on our [How to Apply](#) information page or by getting in touch by emailing HR via [hr@leeds.ac.uk](mailto:hr@leeds.ac.uk).

## **Criminal Record Information Rehabilitation of Offenders Act 1974**

A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our [Criminal Records](#) information page.



### **Salary Requirements of the Skilled Worker Visa Route**

Please note that this post may be suitable for sponsorship under the Skilled Worker visa route but first-time applicants might need to qualify for salary concessions. For more information, please visit [the Government's Skilled Worker visa page](#).

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information, please visit [the Government's page, Apply for the Global Talent visa](#).

