UNCLE: Uranium in Non-Conventional Ligand Environments

Fact Sheet

Project Information

UNCLE

Grant agreement ID: 239621

Project closed

Start date
1 February 2010

End date
30 September 2014

Funded under
Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 999 996,00

EU contribution
€ 999 996,00

Coordinated by
THE UNIVERSITY OF NOTTINGHAM
United Kingdom

Objective

Metal-metal bonds are fundamental to generating step-changes in our knowledge because the periodic table is composed mainly of metals. The PI has recently made a breakthrough by making the first covalent uranium-gallium bond which exhibits sigma- and pi-donation from gallium to uranium. It is a direct model for the unknown isolobal uranium(IV)-CO " unit, and is very significant to explaining why the widely used N-heterocyclic carbenes are so good at supporting transition metal catalysts

and extracting uranium from solutions containing lanthanides such as found in nuclear waste clean up. This result opens the way to non-conventional ligand complexes of uranium and the previous limitation of conventional halide or C-, N-, or O-donor ligands for uranium will be overcome using non-conventional transition metal ligands to establish a new field of uranium-metal bonds. This work will deliver new compounds which will take our understanding of actinide structure, bonding, magnetism and reactivity to a higher platform of understanding, thus bringing an area of the periodic table, which lags behind all others, up to speed and beyond. This project will deliver a whole new field of actinide chemistry, provide unique and hitherto unknown atom efficient reactivity patterns, generate models for the too-hot-to-handle neptunium and plutonium which are present in nuclear waste, and precipitate new ways of thinking about how to solve nuclear waste clean up. This will induce a paradigm shift in uranium chemistry and will be directly included in textbooks of the future. This project will deliver mobile, high calibre, inter-/multi-disciplinary researchers, reversing a strategic skills shortage and retaining them for future employment and benefit to science, industry, and society in Europe.

Fields of science (EuroSciVoc)

engineering and technology > other engineering and technologies > nuclear engineering > **nuclear waste management**

natural sciences > chemical sciences > inorganic chemistry > **post-transition metals**

natural sciences > chemical sciences > **catalysis**

social sciences > economics and business > business and management > **employment**

Programme(s)

FP7-IDEAS-ERC - Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

ERC-SG-PE5 - ERC Starting Grant - Materials and Synthesis

Call for proposal

ERC-2009-StG
See other projects for this call

Funding Scheme

ERC-SG - ERC Starting Grant

Host institution

THE UNIVERSITY OF NOTTINGHAM

EU contribution

€ 999 996,00

Total cost

No data

Address

University Park
NG7 2RD Nottingham
United Kingdom

Region

East Midlands (England) > Derbyshire and Nottinghamshire > Nottingham

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Beneficiaries (1)

THE UNIVERSITY OF NOTTINGHAM

United Kingdom

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