



Murdoch
UNIVERSITY

Research in Chemistry

Chemistry is all around us and affects all aspects of our lives, ranging from our own basic bodily responses through to the very complex and dynamic compounds of the planet we live on. Chemistry is concerned with all aspects of molecules and materials, their physical and chemical properties, their composition and structure, their synthesis and use in the 21st century.

Research in Physical and Materials Chemistry incorporates both experimental and theoretical techniques and covers a wide range of topics including, the synthesis, structures and reactivity of nano-materials, ion effects in solution, the theory of electrolytes, adsorption and surface phenomena, electrode modelling, conduction mechanisms in electronic devices including solar cells, the dynamics of soft-matter for clean energy applications (membranes, hydrogen storage and solar devices), hydrothermal synthesis of carbon microspheres and measuring the kinetics of metal complex reactions in solution.

This area achieved a 5-star ranking in the Australian Government's ERA surveys. The academic staff and postdoctoral fellows in this area are a world-leading research group in solution chemistry.

The research focuses on the measurement and modelling of physico-chemical properties and chemical speciation in real-world systems of industrial, hydrometallurgical or environmental importance, often up to very high temperatures and pressures.

Other work includes fundamental studies of ion solvation and association. As a result of ongoing ARC and industry funding, the laboratory facilities are world-leading. Postgraduate students are highly sought after by industry and research organisations.

Chemistry staff

Professor Glenn Hefter
g.hefter@murdoch.edu.au

Dr David Henry
d.henry@murdoch.edu.au

Assoc. Prof. Lubomir Hnedkovsky
l.hnedkovsky@murdoch.edu.au

Dr Leonie Hughes
l.hughes@murdoch.edu.au

Dr Erich Koenigsberger
e.koenigsberger@murdoch.edu.au

Dr Lan-Chi Koenigsberger
l.koenigsberger@murdoch.edu.au

Dr Damian Laird
d.laird@murdoch.edu.au

Dr Hans Oskierski
h.oskierski@murdoch.edu.au

Dr David Ralph
d.ralph@murdoch.edu.au

Dr Kate Rowen
k.rowen@murdoch.edu.au

For further information

www.murdoch.edu.au/School-of-Engineering-and-Information-Technology/Research/Strategic-Research-Areas/



Research areas

INORGANIC AND MATERIALS

- Investigation of the biochemical pathways of chromium(III) nutritional supplements
- Designing Gallium based nanomaterials for catalysis
- Identifying chemical warfare agent degradation products
- Production and functionalisation of novel nanoparticle materials

ENVIRONMENTAL CHEMISTRY

- Investigating soil water repellency in SW Western Australia
- Microbiological chemistry and resource recovery
- Isolation and characterisation of natural products
- Isotopic tracing of carbon sources in carbonation reactions
- Formation of microbialites in Mg-rich environments

SOLUTION AND PHYSICAL CHEMISTRY

- Measurement and modeling of solubility phenomena
- Investigation of physicochemical properties of electrolyte solutions
- Theory of electrolyte solutions, surfaces and their interactions
- Thermodynamics of aqueous solutions at high temperatures and pressures

RESEARCH PROJECTS AND INDUSTRY COLLABORATIONS

“Delivering enhanced agronomic strategies for improved crop performance on water repellent soils in Western Australia”, GRDC Grant (DAW00244), S. Davies, P. Ward, M. Roper, R. Harper, D. Henry, R. Bell, \$7,252,500

- Australian Nuclear Science and Technology Organisation (ANSTO)
- Department of Agriculture (Western Australia)
- CSIRO Land and Water
- Kyoto University, Japan (Prof. A.Tachibana)
- Memorial University, Canada (Prof. R. Poirier)
- Xi'an Shiyou University, China (Dr J.Song)

RESEARCH FACILITIES

- Murdoch University Facility for Isotopes (MUFI) including EA-IRMS and ICP-MS

Want to know more?

School of Engineering and IT,
Murdoch University
90 South Street, Murdoch,
Western Australia, 6150
Telephone: (+618) 9360 6603
Website: www.murdoch.edu.au

CRICOS Provider Code 00125J

The information contained in this publication was correct as at September 2016, but is subject to amendment without notice. The University reserves the right to cancel, without notice, any units or courses if the number of students enrolled in these falls below limits set by the University.