

Lewis C. Wilkins

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Education and Qualifications

01/2015 – present	PhD in Synthetic Chemistry at Cardiff University
09/2010 – 06/2014	Chemistry MChem (Hons) at University of East Anglia First Class Honours degree
09/2009 – 06/2010	Science Foundation year at University of East Anglia 82% (equivalent of 3 A-C grade A-levels)
09/2006 – 06/2008	A-levels at Wymondham High Sixth Form 3 A2 level passes in biology, chemistry and psychology and 1 AS level pass in mathematics.
09/2001 – 06/2006	GCSE qualifications at Wymondham High School 11 A-C Grades (double science: A, mathematics: A, English language: A)

Further Skills

- Skilled in multiple synthetic techniques such as bench and fume cupboard work including air sensitive techniques such as Schlenk line and glovebox use.
- The ability to operate a suite of Bruker and Jeol multinuclear NMR spectrometers.
- Received extra health and safety, risk assessment and COSHH training, in addition to safe gas cylinder operation, ensuring rigorous risk assessment is conducted in the laboratory.
- Experienced in composing manuscripts as well as supplemental information to a high standard as evidenced by publications to date.
- Supervised numerous visiting and undergraduate students on a day to day basis providing practical and academic guidance.
- Well versed in single-crystal X-ray crystallography from crystal mounting through to structure determination and refinement (over 100 structures solved to date).
- I possess a working knowledge of DFT calculations using Jaguar and Gaussian 09 software.
- Fully trained in the use of high-pressure hydrogenation reactors with relevant safety endorsements.

Research

01/2015 – Present	Cardiff University, supervisor: Dr Rebecca Melen Investigating the use of boron Lewis acids as catalysts for a range of important processes and syntheses of novel compounds. My chief objective is to develop and build upon recent and emerging research into the role of boron Lewis acids such as $B(C_6F_5)_3$ in organic transformations. More specifically, looking at the role of such boranes in various cyclisation reactions as well as frustrated Lewis pair type reactivity.
06/2014 – 09/2014	University of East Anglia, supervisor: Prof Simon Lancaster This project was designed to build on research of my final year and further develop these iron-sulfur clusters.
09/2013 – 06/2014	University of East Anglia, supervisor: Prof Simon Lancaster Functionalization of $[Fe_2\{SCH_2CH(CH_2OH)S\}(CO)_6]$ iron-sulfur cluster and the impact on electrochemical reduction potentials. During my project, I developed and fully characterised six novel diiron dithiolate compounds with subsequent probing of electrocatalytic reduction activity <i>via</i> cyclic voltammetry.

Awards and Achievements

06/06/2016	Awarded Dalton Division RSC travel bursary of £111.17 to attend the Boron in the Americas XV conference, Kingston, Canada.
09/05/2016	Awarded Organic Division RSC travel bursary of £200.00 to attend 99 th CSC conference, Halifax, Canada.
26/01/2016	Accepted to present poster on my work as part of the prestigious SET for BRITAIN competition at the House of Commons, London.
26/01/2016	Awarded RSC Researcher Mobility grant worth £3587.00 to visit to University of Toronto for three months to study under Prof. Douglas Stephan.
01/05/2015	Awarded Dalton Division RSC travel bursary of £644.06 to attend 98 th CSC conference, Ottawa, Canada.

Conference Participation and Contributions

Poster presentations:

01/09/2017	Main Group Interest Group Annual Meeting and AGM- Burlington House, London, UK.
05/06/2016	99 th Canadian Chemistry Conference, World Trade and Convention Centre, Halifax, Canada.
25/05/2016	BORAM XV, Boron in the Americas, Queens University, Kingston, Canada.
29/03/2016	Dalton 2016 Conference, University of Warwick, UK.
23/03/2016	RSC Organic South East Division Meeting, University of East Anglia, UK.
07/03/2016	SET for BRITAIN poster competition, Houses of Parliament, London, UK.
13/01/2016	RSC Organic Section South West Regional Meeting, University of Southampton, UK.
10/06/2015	2 nd Crystal Engineering and Materials Workshop of Ontario and Quebec, Guelph, Canada.
12/05/2015	Cardiff Chemistry Conference, Cardiff University, UK.
21/04/2015	Southern Dalton Meeting, University of Sussex, UK.

Oral research presentations:

07/09/2017	"The Softer Side of Boron: Taming Hard Lewis Acids for Soft-Centered Chemistry" 2 nd Dalton Young Members Event (DYME) 2017, University of Bath, Bath, UK.
15/03/2017	"The Softer Side of Boron: Taming Hard Lewis Acids for Soft-Centered Chemistry" 16 th Cardiff Chemistry Conference, Cardiff University, Cardiff, UK.
11/09/2015	"The Activation of Triple Bonds Through Carboborations, Cyclizations and Dealkylations". Main Group Interest Group Annual Meeting and AGM- Burlington House, London, UK.
13/06/2015	"Diverging Pathways in the Activation of Allenes with Lewis Acids and Bases: Addition, 1,2-Carboboration and Cyclization". 98 th Canadian Chemistry Conference, Shaw Centre, Ottawa, Canada.

Additional Information

01/2015 – present	Associate Member of the Royal Society of Chemistry (AMRSC)
04/2016 – 07/2016	RSC researcher mobility fellowship: 3 month research visit to the University of Toronto, Canada. <ul style="list-style-type: none">• Carried out novel chemistry using fluorophosphonium cations in catalysis, specifically in the generation of new C–C bonds in annulation reactions from benzyl fluoride precursors.• Supplementary research focused on new applications of boranes in reactivity of unactivated alkenes in hydrogenations and carboborations.
05/2015 – 06/2015	Research visit: two week research visit to the University of Windsor, Canada. <ul style="list-style-type: none">• Engaged in a two week training course in X-ray crystallography including structure solving, refinement and disorder modelling with Dr Jeremy Rawson.• Within this training, I also received additional exercises in DFT calculations and other computational methodologies.

04/2011 – 05/2012

Student guide: University of East Anglia

- Be an enthusiastic member of the university with an in depth knowledge of the campus and courses on offer.
- Collaborated with faculty staff and colleagues effectively to deliver an interactive and engaging experience for future undergraduates.
- Aid in laboratory demonstrations.
- Liaise with event staff and faculty and give feedback on the views of the attendees.

Publications

1. Lewis C. Wilkins, Rebecca L. Melen, James A. Platts, Paul D. Newman, "Amidine functionalized phosphines: tuneable ligands for transition metals", *Dalton Trans.*, accepted.
2. Lewis C. Wilkins, Rebecca L. Melen. "Small Molecule Activation with Frustrated Lewis Pairs", *Encyclopedia of Inorganic and Bioinorganic Chemistry*, **2017**, doi: 10.1002/9781119951438.eibc2520.
3. Darren M. C. Ould, Alex C. Rigby, Lewis C. Wilkins, Samuel J. Adams, James A. Platts, Simon J. A. Pope, Emma Richards and Rebecca L. Melen, "Investigations into the Photophysical and Electronic Properties of Pnictoles and Their Pnictenium Counterparts", *Organometallics*, **2017**, doi: 10.1021/acs.organomet.7b00564.
4. Yashar Soltani, Lewis C. Wilkins, Rebecca L. Melen. "B(C₆F₅)₃: Stoichiometric and Catalytic C–C and C–H Bond Formation via Cationic Intermediates", *Angew. Chem. Int. Ed.*, **2017**, *56*, 11995 (equal contribution), *Angew. Chem.* **2017**, *129*, 12157.
5. Lewis C. Wilkins, Nicolò Santi, Louis Y. P. Luk and Rebecca L. Melen, "Reactions of biologically inspired hydride sources with B(C₆F₅)₃", *Phil. Trans. R. Soc. A*, **2017**, *375*, 20170009. (Invited theme issue on Frustrated Lewis Pair Chemistry).
6. James R. Lawson, Lewis C. Wilkins, Rebecca L. Melen, "Tris(2,4,6-trifluorophenyl)borane: An Efficient Hydroboration Catalyst", *Chem. Eur. J.*, **2017**, *23*, 10997. (equal contribution).
7. Thao T. P. Tran, Darren M. C. Ould, Lewis C. Wilkins, Dominic S. Wright, Rebecca L. Melen, Jeremy M. Rawson, "Supramolecular Aggregation in Dithiaarsoles: Chlorides, Cations and *N*-centered Paddlewheels", *CrystEngComm*, **2017**, *19*, 4696.
8. Lewis C. Wilkins, Joseph L. Howard, Stefan Burger, Louis Frenzel-Beyme, Duncan L. Browne, Rebecca L. Melen, "Exploring Multistep Continuous-Flow Hydrosilylation Reactions Catalyzed by Tris(pentafluorophenyl)borane", *Adv. Synth. Catal.*, **2017**, *359*, 2580. (Designated Very Important Publication).
9. James R. Lawson, Lewis C. Wilkins, Manon Andre, Emma Richards, Mohammed N. Ali, James A. Platts, Rebecca L. Melen, "Synthesis and Reactivity of *N,N'*-1,4-diazabutadiene Derived Borocations", *Dalton Trans.*, **2016**, *45*, 16177.
10. Lewis C. Wilkins, James R. Lawson, Philipp Wieneke, Frank Rominger, A. Stephen K. Hashmi, Max M. Hansmann, Rebecca L. Melen, "The Propargyl Rearrangement to Functionalised Allyl- Boron and Borocation Compounds", *Chem. Eur. J.*, **2016**, *22*, 14618.
11. Lewis C. Wilkins, Rebecca L. Melen, "Enantioselective Main Group Catalysis: Modern Catalysts for Organic Transformations", *Coord. Chem. Rev.*, **2016**, *324*, 123.
12. Lewis C. Wilkins, Benjamin A. R. Günther, Melanie Walther, James R. Lawson, Thomas Wirth, Rebecca Melen, "Contrasting Frustrated Lewis Pair Reactivity with Selenium- and Boron-Based Lewis Acids", *Angew. Chem. Int. Ed.*, **2016**, *55*, 11292; *Angew. Chem.*, **2016**, *128*, 11462.
13. Lewis C. Wilkins, Hugh B. Hamilton, Benson M. Kariuki, A. Stephen K. Hashmi, Max M. Hansmann, Rebecca L. Melen. "Lewis acid-base mediated 1,2-addition reactions: Synthesis of pyrylium borates from en-ynoate precursors", *Dalton Trans.*, **2016**, *45*, 5929.
14. Lewis C. Wilkins, Philipp Wieneke, Paul D. Newman, Benson M. Kariuki, Frank Rominger, A. Stephen K. Hashmi, Max M. Hansmann, Rebecca L. Melen, "Pathways to functionalized heterocycles: The propargyl rearrangement using B(C₆F₅)₃", *Organometallics*, **2015**, *34*, 5298.
15. Rebecca L. Melen, Lewis C. Wilkins, Benson M. Kariuki, Hubert Wadepohl, Lutz H. Gade, A. Stephen K. Hashmi, Douglas W. Stephan, and Max M. Hansmann, "Diverging Pathways in the Activation of Allenes with Lewis Acids and Bases: Addition, 1,2-Carboboration and Cyclization", *Organometallics*, **2015**, *34*, 4127.
16. Alexander Bähr, Lewis C. Wilkins, Kevin Ollegott, Benson M. Kariuki, Rebecca L. Melen, "σ- versus π-Activation of Alkynyl Benzoates Using B(C₆F₅)₃". *Molecules*, **2015**, *20*, 4530-4547. (Invited article, special issue on boron chemistry).

Teaching

- 10/2015 – present As the senior PhD student in the Melen group, I have been responsible for day-to-day supervision of members of the group during my tenure at Cardiff University, including junior postgraduate students, Bachelor's and Master's students as well as visiting international students. This also includes providing detailed feedback on presentation preparation, as well as mock thesis defence in preparation for final examinations for all students.
- 01/2016 – 06/2016 Applications of Molecular Spectroscopy: Helped oversee seminars on molecular spectroscopy, aimed at second year undergraduate students to use spectroscopic methods, primarily NMR, to assign compounds, calculate coupling constants, identify molecular conformation and stereochemistry using the Karplus equation.
- 10/2015 – 06/2016 Undergraduate laboratory advisor. Provide day-to-day support to undergraduate students. Assist in practical setup and engage in one-to-one conversations regarding the theoretical background of the experiment being conducted as well as aspects of safety. The workload included marking student scripts and providing detailed feedback.
- 10/2015 – 06/2016 Foundations of Inorganic Chemistry. Co-supervised workshop sessions introducing undergraduate students to coordination chemistry, electron counting, oxidation states, balancing equations and stoichiometry. This included marking of student scripts as well as providing thorough yet clear feedback.