

## CURRICULUM VITAE : Professor Martin Schröder

**Date and Place of Birth:** 14th April 1954; Taplow, Berkshire, UK  
**Nationality:** British  
**Work Address:** School of Chemistry, University of Nottingham,  
University Park, Nottingham NG7 2RD  
Tel: 44 (0)115 9513490 Fax: 44 (0)115 9513563 Mobile: 07767 238477  
Email: M.Schroder@nottingham.ac.uk  
**Home Address:** 2 Alverstone Rd., Mapperley Park, Nottingham NG3 5DQ, UK.  
Tel/FAX: 44 (0)115 9621524

### University Education and Career Since Graduation:

1972-1975 University of Sheffield, BSc Special Honours in Chemistry  
1975-1978 Department of Chemistry, Imperial College of Science, Technology and Medicine, London. PhD, DIC. PhD Supervisor: Dr (now) Professor W.P. Griffith. Thesis Title: Oxo Complexes of Ruthenium and Osmium  
1978-1980 Royal Society / Swiss National Foundation Postdoctoral Fellowship with Professor A. Eschenmoser, Laboratorium für Organische Chemie, ETH, Zürich, Switzerland  
1980-1982 Postdoctoral Research Assistant with Lord Lewis of Newnham, University Chemical Laboratories, The University of Cambridge  
1982-1995 Department of Chemistry, The University of Edinburgh, Edinburgh EH9 3JJ, Scotland. Senior Demonstrator (1982-83), Lecturer (1983-91), Reader in Inorganic Chemistry (1991-94), Personal Chair in Inorganic Chemistry (1994-95)  
1995-present Professor of Inorganic Chemistry, School of Chemistry, University of Nottingham, Nottingham  
1995-2012 Head of Inorganic Chemistry, School of Chemistry, University of Nottingham, Nottingham  
1/1999-8/2005 Head of School of Chemistry, University of Nottingham  
9/2011-present Executive Dean of the Faculty of Science, University of Nottingham

### Awards and Elections:

1978-1979: Royal Society/Swiss National Foundation Postdoctoral Fellowship  
1990: Visiting Professor, Lash Miller Laboratories, University of Toronto, Canada  
1991: Royal Society of Chemistry Corday-Morgan Medal and Prize for 1989  
1991-1992: Royal Society of Edinburgh Support Research Fellowship  
1994: Elected Fellow of the Royal Society of Edinburgh  
1994: Elected Fellow of the Royal Society of Chemistry  
1995: Mellor Visiting Professor, Department of Chemistry, University of Dunedin, New Zealand  
2001/02: Tilden Lectureship and Medal of the Royal Society of Chemistry  
2003: Royal Society of Chemistry Award for Chemistry of Transition Metals  
2004: Visiting Professor, School of Chemistry, Université Louis Pasteur, Strasbourg, France  
2005-2010: Royal Society Wolfson Merit Award  
2005-2006: Leverhulme Trust Senior Research Fellowship  
2005: Honorary Doctorate: Technical University of Tallinn, Estonia  
2008: Royal Society of Chemistry Award for Chemistry of the Noble Metals and their Compounds  
2010: Lecturer of the Year, Leiden Institute of Chemistry, The Netherlands  
2012: Shortlisted for IChemE Award in Energy  
2013: "World Renowned Scientist's Lecture Tour" to Hubei Province, China  
2013: Guest Special Professor of Wuhan University, China

**Publications:** 470 publications and patents. H index 67, over 18800 citations on Web of Science for 422 publications, 44.5 citations per publication.

### Research Interests:

Co-ordination, materials and supramolecular chemistry. Metal organic framework materials as micro and mesoporous hosts for adsorption, purification and selectivity. Supramolecular complex chemistry and self assembly of nanostructures. Ionophores for extraction and transport of precious metal salts. Modelling of hydrogenase and reductase enzymes for hydrogen activation, production and catalysis.

**Membership of Societies:**

Chartered Chemist (C. Chem.), Fellow of the Royal Society of Edinburgh (FRSE), Fellow of the Royal Society of Chemistry (FRSC), Member of American Chemical Society

**Selected Plenary and Keynote Lectures at Conferences:**

- 2010 Plenary Lecturer, Symposium on Hydrogenase Modelling, Leiden, The Netherlands
- 2010 Plenary Lecturer, British Zeolite Association Meeting, Southampton
- 2010 International Conference on Organic Synthesis Balticum Organicum Syntheticum (BOS), Kuressaare, Estonia
- 2010 LIC Lecturer of the Year, University of Leiden, The Netherlands
- 2010 Plenary Lecturer, Hydrogen Storage Materials, EXPO 2010, Shanghai, China
- 2010 Invited lecturer, Pacificchem, Honolulu, USA (3 lectures)
- 2011 Invited Lecturer, VNUHC-UCLA Joint Symposium. The Chemistry of Metal-Organic Frameworks and Related Materials, Ho Chi Minh City, Viet Nam, March 2011
- 2011 Invited lecturer, International Hydrogen Energy Symposium and Showcase, University of Birmingham
- 2011 Invited lecturer, Fourth North America-Greece-Cyprus Workshop on Paramagnetic Materials (NAGC 2011), Patras, Greece
- 2011 Invited Lecturer, Royal Society of Chemistry Discussion Group on Coordination Chemistry, University of East Anglia, UK
- 2011 Invited Lecturer, XXII Congress and General Assembly of the International Union of Crystallography, Madrid, Aug 2011
- 2011 Invited lecturer, ACS Conference (Greenhouse Gas Emissions: Control, Conversion and Utilization for Fuels and Energy Production), Denver, USA
- 2011 Plenary Lecturer, Faraday Discussion 151: Hydrogen Storage Materials, RAL
- 2011 Plenary Lecturer, Materials and Technologies for Green Chemistry, Tallinn, Estonia
- 2011 Plenary Lecturer, Low Carbon Earth Summit-2011(LCES-2011), Dalian, China
- 2011 Plenary Lecturer, Zing Conference on Hydrogen and Fuel Cells, Mexico
- 2012 Plenary Lecture, Polish Academy of Sciences, Physical Chemistry, Warsaw
- 2012 Invited Lecturer, Department of Chemistry, University of Warsaw
- 2012 Plenary Lecturer, Annual Congress, Tallinn Technical University, Tallinn, Estonia
- 2012 RSC Lecture tour in China. Lectures at Sun Yat-Sen University (Guangzhou), Nankai University (Tianjin), Peking University and ECUST (Shanghai)
- 2012 Invited Lecturer (2 lectures) at ACS Meeting, San Diego
- 2012 Invited Lecturer, University of Texas at Austin
- 2012 Invited Lecturer, General Motors, Warren, Michigan
- 2012 Invited Lecturer, Meeting to celebrate Michael O'Keeffe Birthday, Swanage, UK
- 2012 Invited Lecturer, ACS Conference Philadelphia, USA
- 2012 Invited lecturer, 4<sup>th</sup> EuCheMS Congress, Prague
- 2012 Invited lecture Max-Planck Institut für Bioanorganische Chemie, Mülheim an der Ruhr, Germany
- 2012 Invited lecturer ECUST, Shanghai, Shanghai Jiao Tong University and Fujian Institute of Materials, Fuzhou
- 2013 Hydrogen and Fuel Cells Workshop, The Cosener's House, Abingdon, Oxon, STFC
- 2013 Building Global Engagements, University of Nottingham
- 2013 Fuel Cell and Hydrogen 2013, NEC, Birmingham
- 2013 Invited lecturer ACS Conference, New Orleans, USA
- 2013 Invited lecturer, Fourth North America-Greece-Cyprus Workshop on Paramagnetic Materials (NAGC 2013), Cyprus
- 2013 Invited Lecturer, ICMAT 2013, 7<sup>th</sup> Biennial International Conference on Materials for Advanced Technologies, Singapore
- 2013 Keynote Lecturer, International MOF Symposium 2013, Dresden
- 2013 Keynote Lecturer, BuildMoNa Symposium, Leipzig
- 2013 "World Renowned Scientist's Lecture Tour" to Hubei Province, China. Lectures at Wuhan Textile University, Wuhan University, Nanjing University, Soochow University and Changshu Institute of Technology, China
- 2013 Keynote Lecturer, 9th IUPAC International Conference on Novel Materials and their Synthesis (NMS-IX), Shanghai

- 2013 Keynote Lecturer, 4<sup>th</sup> Asian Conference on Coordination Chemistry (ACCC4), Jeju, Korea
- 2013 Invited Lecturer, International Symposium on MOF and Related Open Framework Materials, Zhuhai/Macao, China.
- 2013 Plenary Lecturer, International Symposium on Modern Trends in Inorganic Chemistry, MTIC-XV, Roorkee, India
- 2014 Invited Lecturer, Materials Research Society (MRS) Symposium, San Francisco
- 2014 Invited Lecture, NanoFunMat2014, Warsaw, Poland
- 2014 Keynote Lecture "Classics, Frontiers and Pioneers" International Conference on Coordination Chemistry, ICC-41, Singapore
- 2014 Invited Lecturer, 4th International Workshop on the Transition Metal Cluster Complexes, Novosibirsk
- 2014 Keynote Lecture, Science of the Future, St Petersburg University
- 2014 Plenary Lecture, pre-MOF 2014 Kobe, Japan
- 2014 Plenary Speaker, 26<sup>th</sup> International Chugaev Conference on Coordination Chemistry, Kazan.
- 2015 Invited Speaker, Fifth North America-Greece-Cyprus Workshop on Paramagnetic Materials (NAGC 2015), Athens, Greece
- 2015 Materials meeting, Paris.
- 2015 Plenary Speaker, Inorganic Materials Conference, Huatulco Mexico
- 2015 Invited Speaker, Pacificchem, Hawaii
- Over 340 colloquia, seminars and research lectures have been given worldwide, including major lectures tours of the USA, Germany, Italy, Switzerland, Australia, New Zealand and Japan.

**Research Grants:** Research income of £24 M won over the past 10 years. Highlights include:

- 9 Royal Society KC Wong/Sino British Fellows since 1998
- 2 Royal Society collaborative awards and 2 INTAS grants with collaborators in Russia
- 2 HEROBC and HIRF awards on metal salt extraction
- NEDO Grant, Japan, April 1998-March 2001, "New Dipolar Liquid Crystals: Synthesis, Simulation and Switching" CI with D.W. Bruce (PI, Exeter), H. Takezoe (Tokyo IT), D. Guillon (Strasbourg), T.M. Swager (MIT) and C. Zannoni (Bologna). **85,000,000 Yen (£450,000)**
- EPSRC GR/M/63614, Joint Infrastructure Fund, May 1999 - April 2002. Laboratory Refurbishment and Equipment. "Interdisciplinary Studies in Molecular Sciences" PI, **£3,267,718**
- Marie Curie Host Fellowship HPMT-CT-2001-00376. Sept 2001- Aug 2004. *COSMIC*: Research Training in Co-ordination, Supramolecular and Biological Inorganic Chemistry, PI, **103,200 EUROS**
- EPSRC GR/S/26965. 1st Feb 2004-31st Jan 2007 for three years for 2 PDRA's, a studentship and equipment. Supergen UK Sustainable Hydrogen Energy Consortium (UKSHEC). PI for Nottingham, **£705,000** [as part of a £3.15M consortium]
- Marie Curie Early Stage Training Centre (EST). 1<sup>st</sup> April 2006-31<sup>st</sup> Mar 2010. "Functional Materials for Storage, Sensing, Electronics and Catalysis 'FUMASSEC' FP-2005-020992 PI with M.W. Hosseini (Université Louis Pasteur, Strasbourg) and C. Rovira (Institut de Ciència de Materials de Barcelona, Universitat Autònoma de Barcelona, Spain). **2.12 Million Euros**
- Royal Society-Wolfson Foundation, 1<sup>st</sup> Mar 2008- 28<sup>th</sup> Feb 2010. Refurbishment for Energy Research, PI, **£110,000**
- General Motors (Germany/USA), 1<sup>st</sup> Mar 2008-30<sup>th</sup> Sept 2010. Studies on Hydrogen Storage Materials, PI, **£185,000**
- ISIS beam time 2010 STFC: **£70,020**
- ISIS beam time 2012 STFC: **£308,100**
- ISIS beamtime 2013 STFC: **£497,700**
- EPSRC EP/E040071/1, 1<sup>st</sup> June 2007 – 31<sup>st</sup> Oct 2012. UKSHEC-2 Supergen Consortium. Hydrogen Storage Materials, PI for Nottingham, **£1,050,500**.
- EPSRC EP/F021046, 1<sup>st</sup> Oct 2008 – 30<sup>th</sup> Sept 2012. High Pressure Coordination Chemistry, CI with A.J. Blake, **£174,339**
- European Research Council Advanced Grant, 1<sup>st</sup> Dec 2008-28<sup>th</sup> Feb 2014. Chemistry of Coordination Space: Extraction, Storage, Activation and Catalysis, COORDSPACE. ERC-2008-AdG 226593, PI, **£2,217,578**
- EPSRC CDT EP/G037116. 1<sup>st</sup> Oct 2009-30<sup>th</sup> Sept 2014. Doctoral Training Centre in Hydrogen and Fuel Cells with Birmingham University. PI K Kendall FRS. MS lead academic in Nottingham, **£5,537,269**
- Sino-British Fellowship, Dr. Jian Lu, 1<sup>st</sup> March 2012-28<sup>th</sup> Feb 2014. Halogenated Porous Supramolecular Organic Frameworks: Storage and Separation. PI, **£66,000**
- NSCF Grant IE110999 1<sup>st</sup> Jan 2012 – 31<sup>st</sup> Dec 2014 with Fujian Inst. of Research on the Structure of

Matter (FJIRSM), Chinese Academy of Sciences. Halogenated Porous Supramolecular Organic Frameworks. PI, **£24,000**

- EPSRC Building Global Engagements at the University of Nottingham 1<sup>st</sup> April 2012-31<sup>st</sup> Mar 2013, CI, **£498,637**
- European Research Council, Proof of Concept Grant, 1<sup>st</sup> Jan 2013-31<sup>st</sup> Dec 2013. Sustainable Synthesis of Metal-Organic Frameworks (SUSMOF) ERC-2012-PoC 324588, PI, **€143,028 Euros**

**Current Research Funding** includes:

- EPSRC EP/I011870/1. 9<sup>th</sup> June 2011- 31<sup>st</sup> Dec 2016. Programme Grant: Coordination Chemistry for Energy and our Sustainable Futures (ChemEnSus), PI, **£4,131,988**
- EPSRC EP/I020942. 1<sup>st</sup> July 2011-30<sup>th</sup> June 2015. Modulated Metal-Organic Frameworks for Hydrogen Storage, PI, **£484,906**
- General Motors USA. 1<sup>st</sup> Feb 2012- 31<sup>st</sup> Jan 2015. Nanoscale Materials for Energy Storage. PI, **\$75,000 US**
- PI for joint PhD studentship with STFC, Diamond Light Source on “*In Situ* Synchrotron Powder Diffraction Study of Gas-Loaded Metal-Organic Frameworks for Energy Storage Applications”, 2012-2015, PI, **£94,000**
- PI for joint PhD studentship with STFC, ISIS Neutron Source on “Development and Characterisation of Low-cost, Highly-stable Metal Organic Frameworks for CO<sub>2</sub>, SO<sub>2</sub> and NO<sub>2</sub> Capture and Separation”, 2013-2016, PI, **£69,672**
- EPSRC EP/K038869 Very High Intensity Single Crystal Diffractometers (VHISCD) 1<sup>st</sup> Jan 2013- 31<sup>st</sup> March 2016, CI, **£1,269,650**.
- EPSRC Impact Acceleration Account, Proof of Concept Grant, Metal Organic Frameworks for Carbon Capture, 1<sup>st</sup> Jan 2014- 30<sup>th</sup> June 2015, PI, **£251,126**
- Wolfson Foundation. The GSK Carbon Neutral Laboratory for Sustainable Chemistry at the University of Nottingham for infrastructure development, 1<sup>st</sup> Jan 2014-31<sup>st</sup> Dec 2016, CI, **£750,000**
- Russian Ministry of Science and Education, Megagrant 2013-220-04-041 with Russian Academy of Sciences, Nikolaev Institute of Inorganic Chemistry, Novosibirsk. Porous Metal-Organic Coordination Polymers: From Fundamental Science to Novel Functional Materials, 1<sup>st</sup> Jan 2014-31<sup>st</sup> Dec 2016, PI, ca **£2.5M** (plus Institutional support of **£1M**)
- EPSRC EP/L015633 Centre for Doctoral Training in Sustainable Chemistry, 1<sup>st</sup> Mar 2014-28<sup>th</sup> Feb 2023, named researcher, PI C.J. Moody, **£5,282,600**
- EPSRC Centre for Doctoral Training in Fuel Cells and their Fuels, 1<sup>st</sup> Apr 2014-28<sup>th</sup> Feb 2022, named researcher, PI R.Steinberger-Wilckens, **£4,416,324**
- EPSRC Instrumentation. The Nottingham Gas Adsorption Analysis Suite (GAAS), CI, PI M Hall (Engineering), Dec 2015-Dec 2018, **£522,089**.
- EPSRC EP/M005178 EPSRC-GSK Chair in Sustainable Chemistry, CI, 1<sup>st</sup> Sept 2015 – 31<sup>st</sup> Aug 2019, **£1,114,553**.
- European Research Council, Proof of Concept Grant, 1<sup>st</sup> April 2015-31<sup>st</sup> March 2016. Hybrid Membranes Incorporating Metal-Organic Frameworks (MemMOFs) ERC-2012-PoC 324588, PI, **€147,964 Euros**

51 PDRAs and 92 PhD students have been supervised.

Current group size: 8 PDRA's and 18 PhD students including joint students with colleagues in Nottingham. Some 28 members of the group are now in academic positions around the world.

**Editorial and International Advisory Boards**

Member of Boards of *Polyhedron*, *CrystEngComm*, *J. Supramolecular Chemistry*, *Open Inorganic Chemistry Journal*, *Supramolecular Catalysis*.

## Selected Recent Publications

Structural Aspects of Metal-Organic Framework-based Energy Materials Research at Diamond. D.R. Allan, A.J. Blake, M. Schröder, C.C. Tang and S. Yang, *Phil. Trans. Roy. Soc. A*, 2015, **373**, 20130149.

Supramolecular Binding and Separation of Hydrocarbons within a Functionalised Porous Metal-Organic Framework. S. Yang, A.J. Ramirez-Cuesta, R. Newby, V. Garcia-Sakai, P. Manuel, S.K. Callear, S.I. Campbell, C.C. Tang and M. Schröder, *Nature Chemistry*, 2015, **7**, 121-129.

Methane Adsorption in Metal-Organic Frameworks Containing Nanographene Linkers: a Computational Study. E. Bichoutskaia, M. Suyetin, M. Bound, Y. Yan, M. Schröder, *J. Phys. Chem. C*, 2014, **118**, 15573–15580.

A Robust Binary Hydrogen-bonded Supramolecular Organic Framework with High Carbon Dioxide Adsorption and Selectivity. J. Lü, C. P. Krap, M. Suyetin, N. H. Alsmail, Y. Yan, S. Yang, W. Lewis, E. Bichoutskaia, C.C. Tang, A.J. Blake, R. Cao and M. Schröder, *J. Am. Chem. Soc.*, 2014, **136**, 12828-12831.

Greener Synthesis of Metal-Organic Frameworks by Continuous Flow. P.A. Bayliss, I.A. Ibarra, E. Pérez, S. Yang, C.C. Tang, M. Poliakoff and M. Schröder, *Green Chemistry*, 2014, **16**, 3796-3802.

A Novel Bismuth-Based Metal-Organic Framework for High Volumetric Methane and Carbon Dioxide Adsorption. M. Savage, S. Yang, M. Suyetin, E. Bichoutskaia, A.J. Blake, S.A. Barnett and M. Schröder, *Chem. Eur. J.*, 2014, **20**, 8024-8029.

Analysis of High and Selective Uptake of CO<sub>2</sub> in an Oxamide {Cu<sub>2</sub>(OOCR)<sub>4</sub>} Based Metal Organic Framework. N.H. Alsmail, M. Suyetin, Y. Yan, R. Cabot, C.P. Krap, J. Lü, T.L. Easun, E. Bichoutskaia, W. Lewis, A.J. Blake and M. Schröder, *Chemistry Eur. J.*, 2014, **20**, 7317-7324.

Porous Macromolecular Dihydropyridyl Frameworks Exhibiting Catalytic and Halochromic Activity. B. Xiao, T.L. Easun, A. Dhakshinamoorthy, I. Cebula, P. H. Beton, J.J. Titman, H. Garcia, K.M. Thomas and M. Schröder, *J. Mat. Chem. A*, 2014, **2**, 19889 - 19896.

Studies on Metal-Organic Frameworks of Cu(II) with Isophthalate Linkers for Hydrogen Storage. Y. Yan, S. Yang, A.J. Blake and M. Schröder, *Acc. Chem. Res.*, 2014, **47**, 296-307.

Inelastic Neutron Scattering Study of Binding of Para-hydrogen in an Ultra Microporous Metal-Organic Framework, S. Yang, A.J. Ramirez-Cuesta and M. Schröder, *Chemical Physics*, 2014, **428**, 111-116.

Irreversible Network Transformation in a Dynamic Porous Host Catalysed by Sulphur Dioxide. S. Yang, L. Liu, J. Sun, K.M. Thomas, A.J. Davies, M.W. George, A.J. Blake, A.H. Hill, A.N. Fitch, C.C. Tang and M. Schröder, *J. Am. Chem. Soc.*, 2013, **135**, 4954-4957.

Modulating the Packing of [Cu<sub>24</sub>(isophthalate)<sub>24</sub>] Cuboctahedra in a Triazole-Containing Metal-Organic Polyhedral Framework. Y. Yan, M. Suetin, E. Bichoutskaia, A.J. Blake, D.R. Allan, S.A. Barnett and M. Schröder, *Chem. Sci.*, 2013, **4**, 1731-1736.

Selectivity and Direct Visualisation of Carbon Dioxide and Sulphur Dioxide in a Decorated Porous Host. S. Yang, J. Sun, A.J. Ramirez-Cuesta, S.K. Callear, W.I.F. David, D. Anderson, R. Newby, A.J. Blake, J.E. Parker, C.C. Tang and M. Schröder, *Nature Chemistry*, 2012, **4**, 887-894.

Selective CO<sub>2</sub> Uptake and Inverse CO<sub>2</sub>/C<sub>2</sub>H<sub>2</sub> Selectivity in a Dynamic Bi-Functional Metal-Organic Framework. W. Yang, A.J. Davies, X. Lin, M. Suyetin, R. Matsuda, A.J. Blake, C. Wilson, W. Lewis, J. E. Parker, C.C. Tang, M.W. George, P. Hubberstey, S. Kitagawa, H. Sakamoto, E. Bichoutskaia, N.R. Champness, S. Yang and M. Schröder, *Chem. Sci.*, 2012, **3**, 2993-2999.

A Partially Interpenetrated Metal-Organic Framework for Selective Hysteretic Sorption of Carbon Dioxide. S. Yang, X. Lin, W. Lewis, M. Suyetin, E. Bichoutskaia, J.E. Parker, C.C. Tang, D.R. Allan, P.J. Rizkallah, P. Hubberstey, N.R. Champness, K.M. Thomas, A.J. Blake and M. Schröder, *Nature Materials*, 2012, **11**, 710-716.