University of Birmingham

Professor Peter Raymond Slater BSc, PhD

Professor in Materials Chemistry

School of Chemistry (/schools/chemistry/index.aspx)

Contact details

Telephone +44 (0) 121 414 8906 (tel:+44 121 414 8906)

Email p.r.slater@bham.ac.uk (mailto:p.r.slater@bham.ac.uk)

School of Chemistry
University of Birmingham
Edgbaston
Birmingham
B15 2TT
UK

About

Professor Peter R. Slater is Professor in Materials Chemistry at the University of Birmingham. He has more than 20 years research experience in the area of solid state/materials chemistry, ranging from solid oxide fuel cells to high temperature superconductors. In these areas he has published more than 150 papers in scientific journals, and has written more than 15 invited review articles. His present research is focusing mainly on the development of novel ionic and mixed conductors for energy storage and conversion applications (e.g. batteries and fuel cells), including the use of novel doping strategies to stabilize new systems/improve materials performance.

He is also active in promoting research into new energy technologies to the general public, and in schools.

Qualifications

- PhD in Chemistry, University of Birmingham, 1990
- BSc in Chemistry, University of Birmingham, 1987

Biography

Peter Slater obtained a 1st class BSc degree in Chemistry at the University of Birmingham in 1987, before completing his PhD in the area of high temperature superconductivity. He spent a further 5 years at Birmingham as a postdoctoral research fellow, before moving to the University of St Andrews firstly as a postdoctoral research fellow and then as a temporary lecturer. In 1998 he was appointed as a lecturer in inorganic chemistry at the University of Surrey, and was promoted to senior lecturer in 2004. In 2008 he moved to the University of Birmingham, and was promoted to Reader in Materials Chemistry in 2010, and then Professor in 2012.

He has more than 20 years research experience in the area of solid state/materials chemistry, ranging from solid oxide fuel cells to high temperature superconductors. In these areas he has published more than 150 papers in scientific journals, and has written more than 15 invited review articles. His present research is focusing mainly on the development of novel ionic and mixed conductors for energy storage and conversion applications, including the use of novel doping strategies to stabilize new systems/improve materials performance. Particular international recognition has been received for his work on novel anion doping strategies, and structural studies of superconductor and fuel cell materials.

He is also active in promoting research into new energy technologies to the general public, and in schools.

Teaching

Teaching Programmes

- MSci/BSc Chemistry single honours and major/minor programmes

Postgraduate supervision

Postgraduate Researchers in Professor Slater's group are working on the development of new materials for fuel cells and batteries

For a full list of available Doctoral Research opportunities, please visit our **Doctoral Research programme listings (http://www.birmingham.ac.uk/students/courses/postgraduate/findaphd.aspx/)**

Research

RESEARCH THEMES

- New Energy Technologies
- Fuel Cells and Batteries
- Materials Chemistry
- Superconductivity and Magnetism

RESEARCH ACTIVITY

Current Research projects include

- Development of new electrolyte and electrode materials for solid oxide fuel cells
- Control of the structure and conductivity of mixed metal oxide systems through anion substitutions.

- Development of new Li ion conducting electrolyte
- Synthesis and structural characterisation of mixed anion compounds

Other activities

- Member of the STFC ISIS Crystallography user group (2012-present)
- Member of the STFC ISIS facility Diffraction Panel, 2007-2011.
- Member of the EPSRC College of Referees.
- Member of the Organising Committee for Materials Chemistry-10, University of Manchester 2011.
- Invited International Expert for the UK Government organized “Low Carbon Cars: Exploring the Challenge of bringing Electric Vehicles to Market International Experts’ Meeting”, BERR, London, 27-28 Oct. 2008.
- Member of the EPSRC Functional Materials Panel 2001, 2002
- Secretary of the RSC Solid State Chemistry Group 2004-2006.
- Member of the Organising Committee for SSPC-13 (St. Andrews, 2006), Faraday Discussions (Atomic Transport and Defect Phenomena in Solids, Surrey, 2006).
- Organiser of the RSC Solid State Chemistry Group Annual Meeting (Surrey, 2005)

Publications

- Kendrick E., Kendrick J., Knight K.S., Islam M.S., Slater P.R.(2007) Cooperative mechanisms of fast-ion conduction in oxides with tetrahedral moieties;; Nature Mater. 6, 871-875.
- Kendrick E., Islam M.S. and Slater P.R. (2008), Atomic-scale mechanistic features of oxide ion conduction in apatite germanates;; Chem Commun 715-717.
- Percival J., Kendrick E., Smith R.I., Slater P.R. (2009), Cation ordering in Li containing garnets: Synthesis and structural characterisation of the tetragonal system, Li7La3Sn2O12;; Dalton Trans. 5177-5181.
- Orera A., Sanjuan M., Kendrick E., Orera V., Slater P.R. (2010);Raman spectroscopy studies of apatite-type germanates: correlation with interstitial oxide ion location and conduction; J. Mater. Chem. 20, 2170-2175.
- Shin J.F., Apperley D.C., Slater P.R. (2010);Silicon doping in Ba2In2O5: an example of a beneficial effect of silicon incorporation on oxide ion/proton conductivity; Chem. Mater. 22, 5945-5948
- Panchmatia P.M., Orera A., Rees, G.J., Smith M.E., Hanna J.V., Slater P.R., Islam M.S. (2011); Elucidation of Oxygen Defects and Novel Transport Mechanisms in Apatite Fast-Ion Conductors: Combined 17O NMR and Modelling Studies; Angew. Chemie 50, 9328-9333.
- Porras-Vazquez J.M., Slater P.R, (2012). Synthesis of oxyanion-doped barium strontium cobaltferrites: stabilization of the cubic perovskite and enhancement in conductivity; J. Power Sources 209, 180-183.
- Porras-Vazquez J.M., Losilla E.R., Keenan P.J., Hancock C.A., Kemp T.F., Hanna J.V., Slater P.R. (2013) Investigation into the effect of Si doping on the performance of Sr1-yCayMnO3-δ SOFC cathode materials; J. M. Porras-Vazquez, E. R. Losilla, P. J. Keenan, C. A. Hancock, T. F. Kemp, J. V. Hanna, Peter R. Slater; Dalton Trans 42, 5421-5429.