

Dr Sarah Horswell

Lecturer in Physical Chemistry

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About

Sarah Horswell is a lecturer in Physical Chemistry. She has a range of research interests in the field of Surface Electrochemistry, ranging from biomimetic films to electrocatalysis. Her work has been funded by EPSRC and the EU and she is involved in several national and international collaborations.

Qualifications

- PhD in Chemistry, University of Liverpool, 2000
- MSc in Surface Science and Heterogeneous Catalysis, University of Liverpool, 1995
- BA in Chemistry, Cambridge University 1994

Biography

Sarah Horswell qualified with a BA (Hons) in Chemistry from Cambridge University in 1994. She obtained an MSc in Surface Science and Heterogeneous Catalysis from the University of Liverpool in 1995 and stayed there to study for PhD in Electrochemistry of Nanostructured Systems. She then spent 15 months at the University of Guelph, Canada, where she worked in the area of interfacial electrochemistry and *in situ* spectroscopy. This was followed by a period of 3.5 years at the Fritz Haber Institute in Berlin, Germany, where she worked on electrochemical surface science and catalysis. She took up a position as Lecturer at Birmingham in 2004.

She teaches Physical Chemistry to students in Years 1-4 and is actively involved in teaching development activities. She leads a research group specialising in electrochemical surface science: ranging from biomimetic systems to nanostructures and surface-catalysed reaction

Teaching

Teaching Programmes

- BSc/MSci Chemistry

Postgraduate supervision

PhD and (formerly) MRes project supervision in the areas of solid-supported biomimetic membranes and electrocatalysis

Research

RESEARCH THEMES

Interfacial electrochemistry

Biophysical chemistry

Electrocatalysis

Self assembly

RESEARCH ACTIVITY

The focus of our research is the application of *in situ* optical techniques, particularly infrared spectroscopy, to study adsorption processes and reactions at metal electrode surfaces. Of current interest is the effect of the electric field on the conformation adopted by phospholipid bilayers assembled on electrode surfaces and their interaction with peptides.

Our interests also include modification of surfaces with organic molecules and/or metal nanoparticles, and electrocatalysis. Classical electrochemical methodology is combined with modern *in situ* techniques to determine structure of our tailored surfaces and catalysts as well as reaction mechanisms. The underlying theme of our work is to understand interfacial processes at a fundamental level, with a view toward exploiting this information in the development of new materials, sensors or catalysts

Other activities

Member of RSC Industrial Physical Chemistry Group

Publications

- Logsdail, A.J.,* Cookson, N.J., Horswell, S.L., Want, Z.W., Li, Z.Y. and Johnston, R.L.,* (2010), Theoretical and Experimental Studies of the Optical Properties of Conjoined Gold–Palladium Nanospheres, **Journal of Physical Chemistry C**, 114(49): 21247-21251.
- Joly, K.M., Mirri, G., Willener, Y., Horswell, S.L.,* Moody, C.J. * and Tucker, J.H.R.,* (2010) **Synthesis of an achiral isomer of lipoic acid as an anchor group for SAM formation on gold surfaces** , **Journal of Organic Chemistry**,75(7): 2395-8. Synthesis of an achiral isomer of lipoic acid as an anchor group for SAM formation on gold surfaces , 75(7): 2395-8.
- Hillman, A.R. *, Ryder, K.S., Madrid, E., Burley, A.W., Wiltshire, R.J., Merotra, J., Grau, M., Horswell, S.L. *, Glidle, A., Dalglish, R.M., Hughes, A., Cubitt, R. and Wildes, A., (2010) **Structure and Dynamics of Phospholipid Bilayer Films under Electrochemical Control**, **Faraday Discussions**, 145: 357-379. Structure and Dynamics of Phospholipid Bilayer Films under Electrochemical Control , 145: 357-379.
- Horswell S.L., Pinheiro A.L.N., Savinova, E.R., Danckwerts, M., Pettinger, B., Zei, M.S. and Ertl, G., (2004), **A Comparative Study of Hydroxide Adsorption on the (111), (110), and (100) Faces of Silver with Cyclic Voltammetry, Ex Situ Electron Diffraction, and In Situ Second Harmonic Generation**. **Langmuir**, 20(25): 10970-10981.
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- Burgess, I., Li, M., Horswell, S.L., Szymanski, G., Lipkowski, J., Majewski, J. and Satija, S., (2004), **Electric Field-Driven Transformations of a Supported Model Biological Membrane: an Electrochemical and Neutron Reflectivity Study**. **Biophysical Journal**, 86(3): 1763-1776.
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- Zawisza, I., Lachenwitzer, A., Zamlyny, V., Horswell, S.L., Goddard, J.D. and Lipkowski, J., (2003), **Electrochemical and photon polarization modulation infrared reflection absorption spectroscopy study of the electric field driven transformations of a phospholipid bilayer supported at a gold electrode surface**, **Biophysical Journal**, 85(6): 4055-4075.
- Electrochemical and photon polarization modulation infrared reflection absorption spectroscopy study of the electric field driven transformations of a phospholipid bilayer supported at a gold electrode surface. , 85(6): 4055-4075.
- Horswell, S.L., O'Neil, I.A. and Schiffrin, D.J., (2003), **Kinetics of electron transfer at Pt nanostructured film electrodes**, **Journal Of Physical Chemistry B**, 107(20), 4844-4854.
- Kinetics of electron transfer at Pt nanostructured film electrodes. , 107(20), 4844-4854.
- Electrochemical and PM-IRRAS studies of potential controlled transformations of phospholipid layers on Au(111) electrodes. Horswell, S.L., Zamlyny, V., Li, H.Q., Merrill, A.R. and Lipkowski, J., (2002), **Faraday Discussions**, 121: 405-422., 121: 405-422

