The Southampton Electrochemistry SummerSchool

Instrumental Methods in Electrochemistry

24th – 29th June 2007

A one-week residential course presented regularly since 1969 by the Southampton Electrochemistry Group.

www.soton.ac.uk/~gd/summerschool.html
The course comprises a combination of lectures and laboratory work. The objective is to teach the application of modern electrochemical techniques to problems in *Chemistry, Biology, Sensing, Materials Science, Energy Generation and Storage and Industrial Processing*.

The lectures introduce fundamental electrochemistry and electrochemical techniques. Examples of the use of each technique to obtain kinetic and / or thermodynamic parameters are given and experimental difficulties, modern methods of data handling / analysis as well as the selection of appropriate techniques for particular investigations, are discussed. The practical sessions allow each participant to choose and carry out five selected experiments to reinforce the lectures and many opportunities for informal discussion. A text book together with copies of lecture material as hard copy and a CD Rom are provided.

Topics covered in the course include:

- Electron transfer
- Mass transport in liquids and solids
- Current-time and current-potential characteristics
- Chronoamperometry and Cyclic voltammetry
- Rotating disc electrodes, Ultramicroelectrodes
- AC impedance, Spectroelectrochemistry
- Solid state electrochemistry
- Instrumentation
- Experimental good practice and limitations
Programme

Sun.: Registration and welcome reception

Mon.: Lectures, lunch, practicals, trip to Winchester

Tues.: Lectures, lunch, practicals, free evening

Wed.: Lectures, lunch, practicals, free evening

Thu.: Lectures, lunch, practicals, Course Dinner

Fri.: Practical, lunch, end of course

Lectures

1. Introduction
2. Electron transfer
3. Factors affecting experimental response
4. Time in electrochemistry
5. The double layer
6. Design of experiments
7. Cyclic voltammetry I
8. Impedance I
9. Rotating disc electrodes
10. Solid state electrochemistry I
11. Cyclic voltammetry II
12. Solid state electrochemistry II
13. In situ spectroscopic methods
14. Impedance II
15. Cyclic voltammetry III
16. Microelectrodes
Practicals

Hands on practicals with a choice of 5 out of 12 experiments based on state of the art PC driven instrumentation from leading manufacturers. A typical list of experiments:

1. Cyclic Voltammetry (I) - Surface Reactions
2. Cyclic Voltammetry (II) - Solution Reactions:
3. Digital simulations of electrochemical processes
4. Fuel cells characterisation
5. Rotating Disc Electrode
6. Rotating Ring Disc Electrode
7. Microelectrodes
8. A.C. Impedance Spectroscopy
9. Characterisation of Electrochemical Materials
10. Factors Determining Experimental Response
11. Spectroelectrochemistry
12. Electrodeposition of metals and Scanning Electron Microscopy
SummerSchool Staff

Prof Phil Bartlett
Dr Peter Birkin
Mr Alistair Clark
Dr Guy Denuault
Prof John Owen
Prof Derek Pletcher
Dr Andrea Russell
Prof Frank Walsh

Course Fees

£900, payment before 31st May 2007
£1000, payment after 31st May 2007

The fees include lunches, refreshments, transport (including trip to Winchester), Course Dinner, electrochemistry textbook, lecture notes, laboratory scripts and CD Rom.

The SummerSchool hotels are the Novotel Southampton (£80 - £100 / room / night + breakfast) and the Hotel Ibis Southampton (£60 - £70 / room / night + breakfast). A coach will transport delegates between these hotels and the university and to the social events.

Accommodation is not included in the course fees. Delegates have to make their own reservation, www.novotel.com, www.ibishotel.com
Bookings & Enquiries

Contact

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For additional details visit:

[www.soton.ac.uk/~gd/summerschool.html](http://www.soton.ac.uk/~gd/summerschool.html)