

ESF Programme on
**OPTIMISATION OF SOLID STATE ELECTROCHEMICAL PROCESSES
FOR HYDROCARBON OXIDATION (OSSEP)**



OSSEP Workshop
St. Andrews, Scotland
22-24 June 2000

Programme

Thursday 22 June 2000

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|----------------------|---|
| 12.00 – 12.30 | Arrival and Registration at New Hall |
| 12.30 – 14.00 | Lunch (dining room at New Hall) |
| 14.00 – 14.30 | OSSEP – Benefits and Opportunities of ESF Programme
John Irvine, St Andrews |
| 14.30 – 15.00 | Discussion |
| 15.00 – 15.30 | T Norby, University of Oslo
Direct oxidation of methane in SOFC; a review of the Norwegian Norall programme |
| 15.30 – 16.00 | Tea |
| 16.00 – 18.00 | Solid Electrolytes |
| 16.00 – 16.30 | JR Jurado, ICV-CSIV, Madrid
Combustion Synthesis and Characterization of some Ceria based Electrolytes |
| 16.30 – 17.00 | Richard Baker, University of Dundee
Ionic and Electronic conduction in Fe and Cr doped (La,Sr)GaO ₃ |
| 17.00 – 17.30 | S Tao & JTS Irvine, University of St Andrews
Apatite, a new framework oxide electrolyte |
| 17.30 – 18.00 | DJD Corcoran & JTS Irvine, University of St Andrews
A novel perovskite proton conducting solid electrolyte |
| 19.00 – 20.00 | Wine reception and posters
Conference room, Level 2, New Hall |
| 20.00 | Dinner
New Hall (common room) |

Friday 23 June 2000

- 8.00 – 9.00** **Breakfast** (New Hall dining room)
- 9.00 – 10.30** **Fuel Electrodes**
9.00 – 9.30 J Frade, University of Aveiro
Mixed conducting Sr(Ti,Fe)O₃ materials for hydrocarbon oxidation
9.30 – 10.00 P Holtappels, Technische Universität München
Electrochemical characterisation of ceramic SOFC anodes
10.00 – 10.30 A McEvoy, EPFL Lausanne
Interfaces – the key to efficient charge transfer.
- 10.30 – 11.00** **Coffee**
- 11.00 – 12.30** **Fuel Utilisation**
11.00 – 11.30 N Bonanos, National Laboratory, Roskilde, DK
Thermodynamic and mixed potentials in the study of methane oxidation
11.30 – 12.00 M Ormerod, Keele University
Oxidation of methane and butane in solid oxide fuel cells
12.00 – 12.30 I Metcalfe, University of Edinburgh
to be confirmed
- 12.30 – 13.45** **Lunch** (New Hall dining room)
- 13.45 – 15.45** **Fundamental Studies**
13.45 – 14.15 P Slater, University of Surrey
Structural studies of new electrolyte materials
14.15 – 14.45 SG Martin, University of Madrid
Microstructural study of the defect-fluorite (1-X) Y_{0.5}Zr_{0.5}O_{1.75-x}
Y_{0.75}Nb_{0.25}O_{1.75} solid solution by selected area electron diffraction (SAED)
and
high resolution transmission electron microscopy (HRTEM)
14.45 – 15.15 JA Kilner, Imperial College
K₂NiF₄ materials for oxygen separation membrane
15.15 – 15.45 A Feighery, University of Aveiro
The electrical properties of the mixed conducting system Sr_{1-x}Ti_{1-y}FeyO₃₋₅
- 15.45 – 16.15** **Tea**
- 16.15 – 17.15** **Systems**
16.15 – 16.45 FW. Kleinlein & H Landes, Siemens Erlangen
SOFC-systems
16.45 – 17.15 W Weppner, Christian Albrecht Universität, Kiel
Monolithic fuel cells
- 18.30 – 19.15** **Dinner** (New Hall dining room)

Saturday 24 June 2000

- 8.00 – 9.00** **Breakfast** (New Hall dining room)
- 9.30** **Trip to Isle of May, including lunch**
- 16.00** **Return to St Andrews, approximately**



First OSSEP ESF Workshop

Report

The first OSSEP ESF Workshop was held in St Andrews, Scotland from Thursday 22nd of June to Saturday 24th of June. The workshop was attended by 32 people from across Europe. The meeting was extremely successful, both scientifically and socially.

The meeting began with John Irvine presenting the benefits and opportunities of the OSSEP programme and encouraging more people to take part. He explained the mechanism for workshop support and for grant support. This was then followed by a talk by Truls Norby on direct oxidation of methane in SOFCs in Norway, which was in the form of a general overview and a good introduction to the workshop.

The meeting continued with sixteen further oral presentations concerning solid electrolytes, fuel electrodes, fuel utilisation, fundamental studies and systems, covering the full range of topics in the ESF programme. Presentations were of a very high quality and there was much active discussion. There were also ten posters at the poster session, which was held on Thursday evening before the workshop dinner. Again, this was a very active session and there was much discussion which continued on through dinner. The workshop finished with a visit to a local nature reserve on the Isle of May, which was attended by more than half of the participants, especially those who were staying over Friday night to reduce costs. This was also a very successful event and there was a good deal of scientific discussion during the day. The weather was also kind resulting in a successful day.

During the meeting there was some general discussion as to how the programme should continue or evolve. This was also augmented by an informal meeting of the steering committee, and a number of suggestions and decisions have been made. The second workshop will be in association with the IEA and will be held in Les Diablerets in Switzerland from 17th to 19th of January 2001. This will be on materials and mechanisms in SOFCs and will be organised by Gus McEvoy. The workshop following that will be on synthesis and processing and will be held in November near to Madrid, this workshop will be organised by Jose Ramon Jurado.

It was suggested that the fourth workshop on protonics should be held in a Nordic country, probably not Norway due to a meeting held there in the previous year. It was suggested that this might be held in Risø in spring 2002. There was also some discussion as to whether we should consider applying for a EURESCO and this was to be further considered over the summer. The next deadline is the end of September, for conference series starting in the year 2002. Although this would be an interesting development, it may not be that urgent at this time.

John T.S. Irvine