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OSSEP workshop on ionic and mixed conductors: methods and processes, Aveiro, Portugal, April 2003

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The OSSEP Workshop “Ionic and Mixed Conductors: Methods and Processes” was held in the Department of Ceramics and Glass Engineering, University of Aveiro, Portugal, on 10–12 April 2003. The OSSEP programme, sponsored by the European Science Foundation, is dedicated to the electrochemical conversion of fuels in solid oxide fuel cells (SOFCs) and other promising energy conversion technologies. These systems are based on suitable ionic conductors as solid electrolytes, oxide mixed conductors or catalytically active cermets used as electrode materials, and mixed-conducting membranes for partial oxidation of hydrocarbons. Some of the most important challenges are the development of novel anodes capable of the direct oxidation of natural gas in SOFCs, and electrochemical systems for converting hydrocarbons to synthesis gas. The range of promising mixed conductors includes single-phase materials (e.g. air electrodes and mixed conducting membranes), metal+ceramic cermets (e.g. Ni+YSZ anodes for SOFCs) and other composite materials. The workshop addressed the transport properties, catalytic activity and other relevant properties of ionic and mixed conductors, including relevant property–composition–structure–microstructure relationships, and their dependence on working conditions, prospective applications, etc. Special attention was given to the materials properties needed for the operation under strongly reducing fuel

conditions, guidelines for future progress, and also to the experimental methods for the characterization of ionic and mixed conducting materials under typical fuel conditions. The Workshop was attended by about 60 scientists from Denmark, Germany, Netherlands, Norway, France, Portugal, Russia, Slovenia, Spain, Switzerland and the United Kingdom.

The ESF-OSSEP programme also sponsored the following previous Workshops, organized by different participating laboratories:

“Optimisation of Solid State Electrochemical Processes for Hydrocarbon Oxidation”, St. Andrews, UK, 22–24 June 2000 (organized by J.T.S. Irvine).

“Solid Oxide Fuel Cell Materials and Mechanisms”, Les Diablerets, Switzerland, 16–19 January 2001 (organized by A. McEvoy).

“Processing and Microstructure–Property Relations”, Madrid, Spain, 15–17 November 2001 (organized by J.R. Jurado).

“OSSEP Workshop on SOFC and Proton Conductivity”, Riso, Roskilde, Denmark, 11–13 April 2002 (organized by M. Mogensen).

“Advanced Anodes for High Temperature Fuel Cells”, Strasbourg, France, 9–11 December 2002. This Workshop was co-sponsored by the ESF and NSF and co-organized by J.T.S. Irvine and S. Singhal.