

Introduction

In January 1996, a two-day conference was held at University College London on the topic 'Fuel Cells and Catalysis'. The meeting was the sixth in a series of biennial joint symposia of the Catalysis and Surface Reactivity Group of the Royal Society of Chemistry and the Process Engineering Group of the Royal Institute of Chemical Engineers in the UK. A previous issue of *Catalysis Today* (18 (1993) 303–528) was based on papers presented at the fourth meeting of this conference series on the topic Fuels and Feedstocks: the next generation of catalysts and processes. The current issue concerns a number of the important issues raised at the January 1996 meeting. Seven of the papers were presented by the authors at the University College, London, meeting and two additional papers have been invited.

There are at present many developments taking place in the fuel cell arena which offer great encouragement towards their commercialisation. The development of efficient and commercially viable fuel cells is driven by the rapidly growing awareness of the environment and the importance of its safe preservation. Generation of energy from natural resources requires improved efficiency and greater cleanliness. In principle, the fuel cell offers all that in preference to combustion sources of generation. Its application to transport systems, to stationary power generation and to combined heat and power sources are all under development. Nevertheless, despite the long history of fuel cells, their direct application has been very limited; the reasons for this require careful identification and minimisation. Central to the success of fuel cell technology are the catalyst systems: the fuel cell is an electrochemical reactor, whose required output is the energy released rather than the reaction product. The London meeting concerned the catalysis involved in fuel cells. Gary Acres (Johnson Matthey) gave the

opening overview of this complex field at the London meeting and in the opening paper we have tried to summarise the key messages given by Gary to active researchers in this field. The second review presented by Keith Williams (University of Cambridge) discusses some of the aspects of the design of fuel cell systems in relation to the catalysts.

Andrew Dicks (British Gas) presented a paper on catalytic aspects of the steam reforming of hydrocarbons in the internal reforming fuel cells. This paper sets out the important aspects of steam reforming catalysis in a fuel cell context. Articles by Andrew Hamnett (Newcastle University), John Irvine (St. Andrews University) and Alf Tseung (Essex University) concern electrode development and electrochemical science of fuel cells. Ian Metcalfe, who has recently taken up the chair of chemical engineering at the University of Edinburgh, continues this theme, but from an electrochemistry standpoint. The anodic oxidation of methanol is considered in a paper by one of the editors (Tim Burstein) that was presented at the London meeting. Electrocatalysis and fuel cells chemistry is a fundamental problem of surface science and this aspect is discussed in a paper by Brian Hayden (Southampton University). Finally, Richard Nichols of the University of Liverpool presents a discussion of the electrocatalysis of alcohol reactions using nickel hydroxide.

What emerges from these papers is that, despite the innovations and improvements that have been made over the last few years, there is still much room for further development in fuel cells quite generally, and in their catalysts and electrocatalysts, in particular. Equally, there is probably unprecedented scope for bringing the fuel cell into service.

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