

## Book review

*Chemistry, Energy and the Environment*, edited by C.A.C. Sequeira and J.B. Moffat, Royal Society of Chemistry, ISBN 0854047034.

This book contains a collection of papers constituting the proceedings of the Third European Workshop on Chemistry, Energy and the Environment, held in Estoril, Portugal in May, 1997. The book includes an extremely diverse collection of topics and is almost devoid of a unifying theme. Nevertheless, an interesting group of topics are covered, divided under seven general headings: *Chemistry—Friend or Foe of the Environment; Catalysis in the Service of the Environment; The Challenge of Environmentally Friendly Production of Energy; Energy Sources for 2000 and Beyond; Nuclear Waste; Electrochemical Decontaminations; and Materials Development*. Some of the articles are general reviews and some are devoted to very specific topic treatments. A number of typographical errors have escaped the attention of the editors. Very few of the contributions actually are related to electrochemical power sources.

Continuing themes in the volume are carbon emissions, air pollution, advanced materials, (electrical conductivity, semiconductor properties, mechanical strength), nuclear waste issues—some of them quite horrific, electrochemical technology, corrosion and possible future energy sources.

The wide range of topics covered is illustrated by the content of the first topic area. The initial paper is an encyclopedic review of emissions from power stations in Turkey and concludes that, unless precautions are taken, damage to human health will ensue. This very straightforward statement is followed by two papers on the weathering of stone buildings, both of which come to similar conclusions about the range of measurements that should be made. There is then one paper on the very topical problem of waste management arising from nickel cadmium batteries and this deals with the toxic hazard posed, construction and characteristics of the battery, and the

major types of recycling processes that are employed to deal with nickel cadmium batteries. Also in this section, we find reviews of the extraction of compounds from micro-algae by a supercritical fluid process, a philosophical discussion of environmental risk reduction, a survey of the current status of studies of biomonitoring of the distribution of sea salt in southwest Portugal, studies of smoke emission from a coking plant, the development of a technique for removing hydrogen sulfide from sewage by means of *thiobacillus spIW*. There is then an outline of an international environmental design competition and two papers on leaching, one a general treatment and the second specific to zinc.

The section on catalysis in the service of the environment covers the use of lanthanum-based perovskite structure oxides for the destruction of  $C_1$  chlorinated volatile organic compounds. These perovskite materials offer maximum conversion of the organics from temperatures of about 300°C. There is also a useful description of the role of  $NO_x$  in atmospheric pollution and the use of catalysis for  $NO_x$  removal.

The efficacy of heterogeneous photocatalysis for water treatment is examined. The principle of this process is related to the function of the photovoltaic cell but in the present case, the photoexcitation of the semiconductor (e.g.,  $TiO_2$ ) is exploited in a catalytic reaction to remove a pollutant rather than for the use of power extraction. A wide range of pollutants could be removed in principle but the challenge for this technique is to engineer the process at an acceptable cost. The remaining papers on catalysis cover the catalytic fixation of carbon dioxide to functional polymers, the catalysis of sulfite autoxidation by transitional metal ions, and an analysis of surface diffusion on electrochemical systems.

In summary, any one reader is only likely to find part of the book to be of immediate interest.

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