

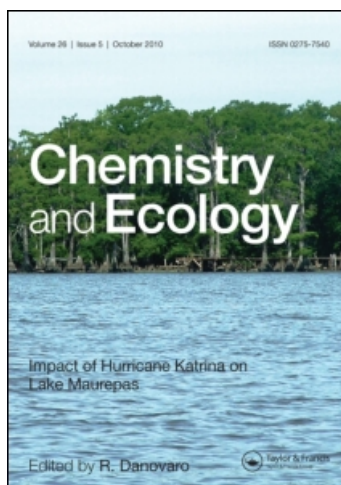
This article was downloaded by:

On: 15 January 2011

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Chemistry and Ecology

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713455114>

Book Reviews

To cite this Article (1990) 'Book Reviews', *Chemistry and Ecology*, 4: 2, 95 – 96

To link to this Article: DOI: 10.1080/02757549008035968

URL: <http://dx.doi.org/10.1080/02757549008035968>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

BOOK REVIEWS

INTRODUCTION, TO INDUSTRIAL GAS CLEANING by F. A. L. Dullien,
Academic Press Inc. \$55.00, 285 pages

Increasing awareness and concern about the impact of anthropogenic activities on the global environment is reflected in the rapidly escalating attention being given to the means of controlling emissions from industrial plant of all kinds. It is thus very appropriate that the present book, aimed at dealing in a straightforward manner with the fundamentals of industrial gas cleaning, should become available at the present time. Based principally on classnotes prepared for courses at the University of Waterloo, it gives a solid basis for relating fundamental science and engineering to the design of practical emission control equipment targetted at both gases and particulates.

The style of writing is clear and concise, with a noteworthy bias to ensuring that the reader gets a proper understanding of the ideas behind what might otherwise be rather obscure technical terminology. As such, it reveals a teacher's experience of what is really needed to get the message across. By the same token however, as intended, this is a text for the student or for those who require a reasonably digestible introduction to the subject, rather than for the dedicated specialist.

In terms of specific content, the chapters relating to particulates, extending from their behaviour in fluids through to the design of separators, from cyclones to electrostatic precipitators and fabric filters are particularly useful. The design of gas scrubbing towers for the control of SO₂ is also examined in worthwhile detail. Conversely dry methods of SO₂ control, e.g. limestone injection into boiler plant, are given less attention than might have been expected; some useful relationships between plant performance and basic concepts might have been demonstrated, particularly in the crucial area of chemical kinetics.

Scant attention is also given to the development of burners to control NO_x emissions from boiler plant, though this is generally the favoured route in terms of cost. The reader, looking for a general introduction to options for NO_x control, thus runs the risk of gaining an unbalanced view of this particular issue. Similarly, the recent emissions targetted developments in the fields of fluidised bed combustion and gasification combined cycles, which embody both techniques of environmental control and improved fuel conversion efficiencies fail to get any significant mention, though again, these are of major commercial interest and also form a valuable vehicle for the demonstration of basic principles.

Overall, therefore this is a useful volume, well worth considering by those looking for a basic introduction to the subject; the reader looking for a description of the current state-of-the-art, is somewhat less well served, however.

W. D. HALSTEAD

KINETICS OF SOIL CHEMICAL PROCESSES by Donald L. Sparks, 210pp. Academic Press Inc., 1989.

In recent decades soil chemistry has been struggling out of the dark ages of empirical extractions and simple advice to farmers that had been its role for too long. This book encourages one to think that it has finally arrived as a serious and rigorous scientific discipline. In fact, for some while we have had considerable understanding of soil components at equilibrium, but real soils are more than the sum of their components, and they are rarely at equilibrium. Many processes of importance in both environmental and agricultural problems are mediated by soils under non-equilibrium conditions, so that there has recently been much interest in rate processes in soils. Jorg Richter (*The soil as a reactor*, Catena Verlag, 1987) dealt with these to some extent, but the present book differs from Richter's by including many detailed chemical experiments.

The author suggests two reasons for the importance of the study of kinetics in soils: to predict how quickly a quasi-equilibrium state is reached, and to investigate reaction mechanisms. He shows that the time-dependent behaviour of soil processes are a combination of true chemical kinetics (i.e. reaction-controlled molecular processes where transport is not limiting) and transport-controlled kinetics. Following an introductory chapter, these processes are described in detail with appropriate mathematical treatment in eight chapters that deal successively with: a brief overview of chemical rate laws and their application to soil constituents; experimental methods for studying diffusion-controlled reactions; relaxation methods for studying rapid reactions; ion-exchange reactions; reactions of organic pesticides; rates of chemical weathering; redox reactions; and kinetic modelling of soil reactions. More important for the reader is how well these topics have been treated, and here one is filled with admiration. The literature coverage is comprehensive, the exposition is lucid, and the organisation of the book is excellent, using many experimental studies to illustrate the principles being developed.

This is a very valuable and welcome addition to the serious soils literature. However, it deals very largely with rate processes in soil components in the laboratory. Field processes in structured soils are much more intractable, but it is these that are so important for understanding the practical problems such as reversion of fertilizers, leaching of nitrates and pesticides into drainage waters, interactions of acid rain with soils, and rates of soil loss and soil development. Some of the approaches and treatments given here, as well as being valid in their own right, should lead on to the solution of these field problems.

B. W. BACHE