

## BOOK REVIEW

*Les hautes températures et leurs utilisations en chimie*, by P. LEBEAU AND F. TROMBE, 2 vols., 1398 pages, 820 illustrations, 107 tables, paper bound 8,200 fr., bound in paper boards 9,000 fr., Masson et Cie, Paris, 1950.

High temperatures and the methods of attaining them cover a very wide field. The applications of high temperatures to achieve chemical changes are infinitely varied and limitless. The two volumes comprising this book could not, therefore, represent more than a series of introductions to many subjects, each of which could readily be expanded to form a separate volume in itself. Some 35 contributors have assisted MM. LEBEAU AND TROMBE and the praiseworthy manner in which a difficult task has been achieved must be attributed to the fact that so much of the expert knowledge available in France has been drawn upon, several of the authors having a well deserved international reputation. The literature on high temperatures is not readily traceable and the authors are to be congratulated, not only on the many thousands of references mentioned in the text, but on the excellent manner in which these references are collected in bibliographies at the end of each chapter.

The first four chapters which cover non-electrical methods of achieving high temperatures include a good review by M. TROMBE (chapter III) on solar furnaces which are being studied again in France since the historic experiments of LAVOISIER. Chapter IV by Prof. HACKSPILL and Prof. CUEILLERON on the atomic hydrogen flame is a full but concise summary of a most interesting subject.

Chapters V to XVIII deal with furnaces depending in one way or other on electrical energy and they contain a wealth of collected information of much value to anyone engaged in high temperature work. The criticism might be made that there is insufficient mention of industrial furnaces, but that is perhaps not surprising since the book has been written with the accent on first principles and laboratory equipment.

That references should be made in chapter VIII to molten salt baths fed with alternating current is understandable, but the need for trying to cover electrolysis is questionable. The result is that, after suggesting on page 375 that industrial processes are not being considered, the author of this chapter covers the Héroult-Hall process, the three-layer electrolytic refining of aluminium, the preparation of rare earth metals, the electrolytic production of magnesium, the Downs sodium cell, etc., quite inadequately in the small space of about fifteen pages. Even so, when dealing with electrolytic magnesium, he refers to a molten carnallite or to a fused fluoride bath containing dissolved magnesia. Neither of these electrolytes is in use to-day for the electrolytic production of magnesium which is exclusively carried out by means of magnesium chloride-containing fused chloride electrolytes.

Some criticism might also be levelled at chapters XXI to XXXII dealing with materials for lining high temperature furnaces. Whilst refractories could obviously not be omitted from a text book on high temperatures, the chapters on refractories and particularly those on the refractory oxides silica, alumina, magnesia, zirconia, etc. perhaps suffer somewhat by comparison with the fuller treatment in some text books published in this field. Nevertheless, the full bibliographies make up for the necessarily condensed treatment of a very extensive subject.

A somewhat disconcerting feature to a non-French reader, and perhaps an unnecessary one, is the use in the same book of two ways of setting out quite simple formulae (e.g.  $\text{SiO}_2$  and  $\text{O}_2\text{Si}$ ) and to the use of the symbols Ct and Gl for hafnium and beryllium respectively. An example of this is  $6\text{O}_2\text{Si} \cdot \text{O}_3\text{Al}_2 \cdot 3\text{OGl}$  in the Table of Constants, page 1276.

These remarks are not intended to detract from the high degree of excellence of the book. The book brings together in two very readable and systematically arranged volumes a large mass of widely scattered information. It is also well printed and bound and should certainly find a place as a standard work of reference on the shelves of all who are engaged in work involving high temperatures.

A. L. HOCK (Manchester)