

bitumen and road oil, ignition quality of Diesel fuel, knock-rating of aviation fuels (weak mixture), knock-rating of motor fuel, penetration of greases and petroleum, saponifiable matter, smoke-point and unsaponifiable matter in drying oils. Some minor alterations concern thermometers employed in determination of specific gravity ('I.P. 46W. Gravity Balance') and specific refractivity ('I.P. 45W. Refractometer').

The format of this volume follows much the same pattern as the eighth edition. Both arrangement and indexing reflect great credit on the editorial sub-committee and permanent officers of the Institution concerned. No one involved in routine investigation of petroleum and its products can afford to be without this latest "Standard".

H. B. MILNER

## CHEMISTRY OF ACETYLENE

### The Chemistry of Acetylene and related Compounds

By Ernst David Bergmann. (Polytechnic Institute of Brooklyn: Lectures on Progress in Chemistry.) Pp. vii + 108. (New York and London: Interscience Publishers, Inc., 1948.) 18s.

THIS book is the latest representative of a series of short lecture-monographs. The title would seem to be rather grandiloquent for a work of this type; but, in fact, the author has managed to consider, albeit superficially, most of the reactions and transformations of this important class of organic compounds.

The first lecture enumerates the thermodynamical and physical data connected with the triple bond and also deals with addition to acetylenes, the 'iso-acetylene' hypothesis and the reactions exhibited by compounds containing the ethynyl group. The second discusses the addition of nitrogen compounds to acetylenes and then proceeds to give an admirable précis of the researches of Reppe. The work of the Weizmann school is described a little over-enthusiastically; but this is perhaps natural in a publication by one of its members. This latter section serves a useful purpose in making available the results of this school in a form for easy reference; hitherto they have been scattered throughout the patent literature. Many tantalizing references to unpublished work are mentioned; in particular, one awaits with considerable interest the details of the vapour-phase isomerization of dimethylethynylcarbinol to  $\beta$ -methylcrotonaldehyde. The last lecture describes the nature of the condensation catalyst employed by the Weizmann school and continues with a discussion of acetylenic polymers, including vinylacetylene and cyclooctatetraene; the book ends with a brief account of naturally occurring triply-bonded compounds. References are amply provided throughout.

The book is written in a highly personal manner, and many of the mechanisms accepted by the author must be considered to be still *sub judice*. The style is on the whole clear and concise, although irritating pedantries occasionally occur (for example, the use of 'analogon' for the far more usual 'analogue'). Over-compression has rendered one sentence (p. 88) completely beyond comprehension. The author succeeds in conveying the spectacular synthetic possibilities of the acetylenic compounds and the stimulating experience of working in this field.

R. A. RAPHAEL

## THE ANODIZING OF ALUMINIUM

### Werkstoff Aluminium und seine anodische Oxydation

Ein Handbuch und Ratgeber für den Praktiker. Von Dr. Max Schenk. Pp. 1042. (Bern: A. Francke A.-G., 1948.) 138 Swiss francs.

ALTHOUGH information on the technical reinforcement of the oxide film on aluminium and its alloys is to be found in papers in scientific publications, articles in trade journals, and patent specifications, it is often difficult to trace, and books on the subject are not numerous. The issue of Dr. Max Schenk's book, dealing with the subject comprehensively and critically, and written by an author having a wide knowledge of the processes involved, is therefore to be welcomed. It is primarily intended for the practical man, but is no mere compendium of technical processes and applications. Dr. Schenk holds the view that to understand the processes involved, to operate them successfully, and to make full use of the product, requires considerable knowledge of the chemistry and physics of aluminium and its compounds, coupled with some acquaintance with the various processes of fabrication to which the metal may have been subjected. The book accordingly comprises two sections, approximately equal in length, the first dealing with the structure, properties, and fabrication of the metal, and the second with the chemical and electro-chemical processes used to produce coherent oxide films and with the properties and applications of the product.

The first quarter of the book is devoted to the metallography and fabrication of aluminium and its alloys, and covers constitution, casting, rolling, heat-treatment, forming and methods of jointing. The descriptions of the processes are short but adequate, and the treatment is essentially practical. Thus figures and diagrams are given showing the effect of alloying and of processes such as cold working and heat treatment on the structure and properties of the product, while current theories on these subjects are given in outline but are not discussed at length. Stress is laid throughout on the behaviour of the product during anodizing, special attention being given to the effects of variations in processing conditions and of faults during fabrication. Useful tables are included giving the compositions and properties of commercial cast and wrought alloys, though so far as British alloys are concerned the list is by no means complete. Recommendations are also made for optimum working and annealing conditions, and for solution and precipitation treatments in the case of the heat-treatable alloys.

The next part of the book is devoted to general chemical theory, particularly electrochemistry, and is followed by an account of the chemistry of aluminium and its compounds. This section is comprehensive, clearly written, and well illustrated; and the chapters on the formation and properties of the oxide film should lead to a clear understanding of the technical processes and applications of anodizing. The section dealing with the chemical behaviour of aluminium and aluminium alloys towards various reagents includes no less than sixty-three pages of tables. The chapters on corrosion are detailed and lucid; but their value is lessened by the fact that research by other than German workers has been largely ignored.

The next section of the book, dealing with technical methods of forming the oxide film, opens with