

BOOK REVIEWS

Tables of Percentage Composition of Organic Compounds.

By H. GYSEL, Verlag Birkhäuser, Basel, Switzerland. 1951. xxii + 637 pp. Price 125 Swiss francs.

This work presents calculations accurate to two decimal places of the percentage composition and molecular weights for some 70,000 compounds. The main tables include compounds of the types

- C-H (to $C_{60}H_{120}$), 8 pages
- C-H-O (to $C_{52}H_{106}O_6$), 110 pages
- C-H-N (to $C_{60}H_{60}N_6$), 68 pages
- C-H-O-N (to $C_{60}H_{102}O_4N_6$), 428 pages

In view of the fact that direct oxygen determinations are conducted in some microanalytical laboratories, the per cent. of oxygen is given along with those of the other elements present. Since the atomic weight of sulfur is approximately double that of oxygen, the second and fourth tables may be used for compounds containing sulfur with errors of no more than 0.01-0.02% in the percentages or 0.04-0.06 unit of molecular weight.

The percentages were calculated to 0.001% and rounded off to the second decimal place. The author states that the calculations, made in the microanalytical laboratories of the firm of Ciba in Basel, were checked several times by various members of the staff by different methods and that they "may be assumed to be almost free from errors."

The tables are ingeniously arranged in a simple, compact, easy-to-use manner, and anyone engaged in organic research will find Gysel a joy to possess. The saving in time in one's own calculations, the value of such a compilation in spotting reasonable empirical formulas, and its convenience in checking calculations of others were evident to me at once since for the past year I have been using the small table in E. P. Clark's "Semimicro Quantitative Analysis" (1943) with great satisfaction. The Clark table of eighteen pages is limited to compounds from C_{15} to C_{32} with from 1 to 9 atoms of oxygen, but it covers about two-thirds of the compounds with which I have been working. The only serious limitation of the Gysel tables is the failure to include halogen; that the tables can be used indirectly for compounds containing Br_2 , approximately equivalent to O_{10} , seems to me of minor significance.

To gain some idea of the general usefulness of the Gysel and Clark tables, I took a poll of the experiences of twenty-one men from four research groups over an average period of ten months and covering a total of 355 formulas. Incidentally the local calculations, including over a thousand separate figures, agreed with Gysel to within 0.01 unit. Of the total formulas considered, 76% are listed in Gysel and only 32% are to be found in Clark. The cases listed were exclusive of isomers, and probably a number of calculations on rejected formulas were omitted because the records had not been kept. Thus it is on the conservative side to estimate from this survey that the average worker having access to Gysel will be spared some 15 calculations per year. It took our group an average of 3.5 minutes to calculate the percentage composition of $C_{20}H_{46}O_3$, and more typical formulas would perhaps require about 4 minutes, which would mean a saving of at least one hour per year per man. Some individuals having heavier requirements would accumulate saved time commensurate with the cost of the book in a very

few years. For a research group of ten persons the saving of a minimum of ten hours of research time would fully justify purchase of a book for exclusive use of the group in a single year.

The book is beautifully printed, but the paper is poor and the pages curl up with brief use. The supplementary table of multiples of elements would be more useful if it included the logarithms, and the table of logarithms would be more appropriate if it were a five-place rather than four-place table. We found only one mistake, an easily detected error in the molecular weight of $C_{32}H_{64}O_2$ (p. 63).

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Medicinal Chemistry. Chemistry, Biochemistry, Therapeutic and Pharmacological Action of Natural and Synthetic Drugs. Volume II. By ALFRED BURGER, Associate Professor of Chemistry, University of Virginia. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1951. xv + pp. 579-1084. 16 × 23.5 cm. Price, \$10.00.

The second volume of this text on medicinal chemistry continues along essentially the same lines as the earlier volume. Typical chapter headings are sulfonamide drugs, chemotherapy of acid-fast infections, antibiotics, antifungal agents and anthelmintics, antimalarials and hormones. This last is somewhat unbalanced, reflecting perhaps current interest, in that proteinogenous and polypeptide hormones are dismissed with less than 8 pages, while the more popular and probably better characterized steroid hormones require more than 65 pages for presentation. One might be disinclined to agree with the author's statement that combination of zinc-insulin "with the protamine spermine produces the so-called protamine-zinc-insulin complex" (p. 518).

Although the essential amino acids are important in nutrition, it is questionable whether they belong in a book devoted to a discussion of "natural and synthetic drugs." Since the text will undoubtedly be used by many to whom the medical and biological sciences are not entirely familiar, the chapters introductory to many sections concerned primarily with organic chemistry should prove particularly valuable; thus the sections on dyestuffs in chemotherapy, the sulfonamide drugs and antimalarials are prefaced by an excellent discussion of the important theories of metabolite antagonism, a subject not covered as extensively in any book similar to the present series so far as the reviewer's knowledge goes. Similarly the section on antiseptics is preceded by a brief but excellent treatment of the subjects of sterilization and disinfection.

The present volume contains a cumulative index of the contents of both parts of this treatment of medicinal chemistry. The completion of this text makes available to the student and investigator an excellent summary of problems in and results of research in synthetic pharmaceutical chemistry and the volumes can be recommended as useful adjuncts to the library of workers in this field.

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