Book Reviews

Infrared Absorption Spectra of Steroids. An Atlas. Konrad Dobriner, E. R. Katzenellenbogen, and R. Norman Jones. Interscience, New York–London, 1953. xlv + 308 pp. Illus $11.50.

During the last decade, infrared absorption spectroscopy has been increasingly used to identify steroids, and infrared spectrophotometers have become routine instruments in many laboratories concerned with the study of steroids.

The infrared study of steroids was largely pioneered by two of the authors of this volume, the late Konrad Dobriner at the Sloane-Kettering Institute for Cancer Research in New York and R. Norman Jones at the National Research Council of Canada in Ottawa. By combining infrared spectroscopy with absorption chromatography, they were able to develop an elegant procedure for identifying and quantitatively determining the many urinary steroids excreted by patients in a variety of physiological and pathological states. During this investigation, the infrared spectra of more than a thousand steroids were recorded, and a series of spectral absorption characteristics were identified. These characteristics may be used to identify oxygen-containing functional groups, to locate certain unsaturated linkages, and to establish the stereochemical configurations at certain positions. Moreover, the infrared spectrum of a steroid is unique, and if the compound under study has been prepared previously, its identity can be established by comparing its spectrum with that of an authentic sample.

Dobriner and Jones have published many valuable tables containing correlations of spectral absorption frequencies with functional groups in steroids, but until the publication of this book spectroscopists had been handicapped by the lack of a set of reliable steroid reference spectra. This volume contains a collection of nearly 300 spectra and goes a long way toward overcoming the deficiency. Most of the spectra are of steroid hormones and of their metabolites and derivatives, but representative curves for steroid alcohols, bile acid esters, steroid sapogenins, cardiac aglycones, and steroid alkaloids are included.

The spectra are preceded by a short introduction, in which correlations of spectral absorption frequencies with structure are briefly discussed. This is followed by a bibliography that lists the principal publications on the infrared spectra of steroids. It is unfortunate that the introduction was not expanded to include in a convenient form much of the information contained in the original papers listed in the bibliography. Perhaps we may hope that in a future publication this defect will be remedied.

The spectra were obtained for solutions in carbon disulfide and in either carbon tetrachloride or chloroform and were recorded on a modern double-beam spectrophotometer as plots of percentage absorption against wave number; they are generally complete from 650 to 1800 cm^{-1}, but a few representative spectra covering the region 2700 to 3700 cm^{-1}, are given. Each spectrum occupies a full page, and the standard of reproduction is unusually high. I had no difficulty in establishing the identity of some of my spectra with certain of those included in this book. The structural and empirical formula of each compound and the concentration, solvent, cell length, and prism used in each spectral region are recorded. On the other hand, no physical data that might indicate the purity of the samples examined, such as melting points and optical rotations, are listed.

This book is essential to all those using infrared spectroscopy in the field of steroid chemistry. The method of reproducing the spectra should serve as a model for future compilations of infrared spectra.

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The Collected Papers of Stephen P. Timoshenko. McGraw-Hill, New York–London, 1953. xxv + 642 pp. Illus. $15.

The Collected Papers of Stephen P. Timoshenko are presented in four languages—German, French, English, and the universal language of mathematics. As a language, mathematics is subject to the same criterions of style as any other. A mathematical paper may be clear or abstruse, concise or prolix, elegant or uncouth. Every one of these papers is a masterpiece of clarity and elegance; as for brevity, Timoshenko strikes exactly the right balance, at least for engineers, who are seldom profound mathematicians. He never labors the obvious, but on the other hand, he never jumps a great chasm from one equation to another with the cliché "from this we readily derive . . . ," when the reader cannot make the derivation readily, if at all.

Eight of these papers are in German, written during the period 1910–24, two are in French, published in 1913 and 1914, and the remaining 25, the first of which appeared in 1921 and the latest in 1947, are in English. Twenty-three papers written in Russian, between 1905 and 1917, are listed by translated title only; much of the material in these is said to have been translated later into one of the other languages. Publication of the original Russian papers would have been a formidable editorial task, but it is regrettable that they could not have been included or, at least, some indication given as to where their content may now be found. There is substantially no repetition in Timoshenko's works, and nothing he wrote is unimportant.

Although the French papers are only two in number, they occupy a substantial portion of the book. One of them is the famous "Sur la stabilité des systèmes élastiques," 133 pages in length, which ap-