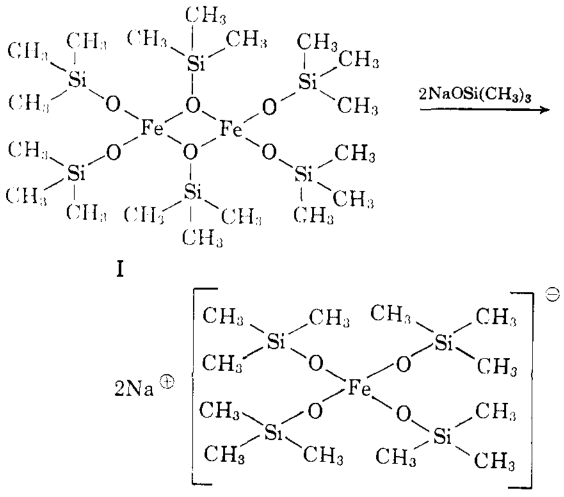
anion are precipitated. Calcd. for $Na[Fe(OSiMe_3)_4]$: Na, 5.28; Fe, 12.82. Found: Na, 5.47; Fe, 13.20. Calcd. for $K[Fe(OSiMe_3)_4]$: K, 8.66; Fe, 12.37. Found: K, 8.71; Fe, 12.51.

Not melting up to more than 200° and insoluble in organic solvents these "heterosiliconates" are typical salt-like substances. The infrared spectra of the sodium and potassium salt (in Nujol mull) show a new and characteristic [ν Si–O–Fe]- band at 11.05 and 10.92 μ, respectively. All the bands of the spectra are almost independent of the cation and exhibit the existence of a discrete $[Fe(OSiMe_3)_4^-]$ anion, as proposed in formula II.

The compounds I and the anion II again[1,4,5] are examples for a class of "complex silicones," which give evidence that the siloxy group, in spite of its strong $d\pi p\pi$ bond character between silicon and oxygen is able to act as a mono- and divalent ligand to form stable complex compounds. The preparation, properties, n.m.r. and infrared investigations of analogous alumino- and gallo-siliconate anions will be reported elsewhere.[5]


I

II

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(4) H. Schmidbaur and M. Schmidt, *J. Am. Chem. Soc.*, **84**, 1069 (1962).

(5) H. Schmidbaur and M. Schmidt, *Angew. Chem.*, **74**, 589 (1962).

BOOK REVIEWS

Notes on Molecular Orbital Calculations. By JOHN D. ROBERTS, Professor of Organic Chemistry, California Institute of Technology. W. A. Benjamin, Inc., 2465 Broadway, New York 25, N. Y. 1961. ix + 156 pp. 15 × 23 cm. Price, $4.95.

This small book very effectively shows how the organic chemist can use Hückel LCAO molecular orbital theory in its simplest form to obtain values of bond orders, atomic charges, free-valence indexes, and other quantities and conclusions of importance to him. Numerous exercises give opportunity for helpful practice in the application of methods and rules.

The chapters are entitled "Atomic Orbital Models" (22 pages), "Molecular Orbital Calculations. Electronic Energy Levels" (30 pages), "Bond Orders, Free-Valence Indexes, and Charge Distributions" (8 pages), "Application of Group Theory to Simplification of MO Determinants" (12 pages), "Aromaticity" (4 pages), "Molecules with Heteroatoms" (5 pages), "Nonplanar Systems" (9 pages), "Molecular Orbital Theory and Chemical Reactivity" (14 pages), "Approximate Methods" (10 pages) and "Higher-Order Calculations (3 pages). Following these are three Appendices, one on solutions of typical exercises, the second including reprints of two articles, the third a brief bibliography of reference books.

The appearance of the book is very attractive, and diagrams (prepared by the author personally) are numerous, clear and helpful. Only a few unimportant misprints were noted. In a few places terminology seems to be rather unorthodox or confusing. Thus on p. 28, a secular equation (that is, a secular determinant equated to zero) seems to be called a "secular determinant." On p. 59, "self-consistent field" is used in what seems to the reviewer a strange way. On p. 66, the author describes the operations of a symmetry group which he calls D_{2v}, although others call it D_2; however, the group which he actually needs for π-electron systems is C_{2v} (one rotation and two reflections instead of three rotations); but by ignoring the fact that two of the rotations turn π-orbitals upside-down, correct results are obtained. Similarly, on p. 70 the group C_2 (with one rotation) is described instead of C_s (with one reflection), but again correct results are obtained. But, if "a rose by any other name would smell as sweet," the above-mentioned deviations do not matter. They do not affect the value of the book as an extremely useful, practical primer for the application of Hückel theory to organic chemical problems. However (though again this does not affect the usefulness of the book), the reviewer does not see why on p. 56 the author uses "trimethylenemethane" with three double bonds from a central carbon atom, hence for the latter a valence of six, as a reference standard for the free valence index.

The author might have provided helpful orientation for those wishing to go deeper, if in the last chapter he had briefly pointed out certain characteristic quantitative faults of the simple Hückel theory, such as that it exaggerates the charges on atoms when charges are present, and exaggerates the bond orders of conjugated "single" bonds, like the central bond in butadiene.

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Progress in High Polymers. Volume 1. Editors, J. C. ROBB, PH.D., D.Sc., and F. W. PEAKER, PH.D. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1961. vii + 340 pp. 16.5 × 25.5 cm. Price, $12.00.

This work, intended to be the first of a new series, is a collection of critical review articles in the field of polymer chemistry. The diversity of topics covered is such that at least portions of the book should be useful to anyone active in polymer research.

The first article, "The Theory of High Polymer Solutions" by T. B. Grimsley, rather than being primarily a review of the literature in the broad field defined by the title, presents a systematic, concise exposition of the theory. The author