SYNTHETIC RUBBER

Synthetic Rubber from Alcohol. A survey based on the Russian literature by Anselm Talalay and Michel Magat. 298 pp. New York, N. Y.: Interscience Publishers. 1945. $5.00.

The first part of this book is a description of the Lebedev process which has been developed and used in Russia for the manufacture of butadiene from ethyl alcohol. In contradistinction with the multi-stage Carbide and Carbon process utilized in this country, the Lebedev process is a one-step catalytic process technologically simpler but yielding a large variety of by-products which have to be separated from butadiene before polymerization. Technical data on the rectification of the unconverted ethyl alcohol, on the absorption, desorption and distillation of the crude butadiene, on the separation and utilization of the by-products is given with some details in Chapters I and II.

The second part of the book is a well-integrated exposé of the present theories of polymerization phenomena and of physicochemical measurements of polymer properties. The authors very wisely did not confine themselves to the sodium polycondensation of butadiene, which is, according to the literature, the only process used by the Russians in the manufacture of synthetic rubber from butadiene; they present one of the best general treatments of the various polymerization techniques to be found in the literature. They have classified the abundant physicochemical data of the Russian investigators and frequently interpreted them in the light of recent theoretical concepts. They have also compared, when data were available, physical characteristics of sodium polybutadienes with that of emulsion polybutadienes and natural rubbers.

If the sole purpose of the authors was to make available, in a comprehensive form, the abundant literature published in Russia on the subject, they have fully succeeded in their task. As such, the book will be found very helpful to those interested in the field of polymerization.

From a general point of view this book is a war casualty of censorship and withholding of information. Examination of the bibliography shows how very little information has been published in Russian journals since 1936. It is the feeling of the reader that for one reason or another much pertinent scientific information has been omitted, thus rendering the treatment sometimes incomplete and occasionally scientifically meaningless. As a flagrant example, catalysts used in the Lebedev process are identified as a mixture of catalysts A and B with c and d as promoters. There is no indication as to what is the specific identity of catalysts A, B, c and d; whether the catalyst mixtures were identified by A, B, c, d in the Russian literature is not clarified, surprisingly enough considering how much other detailed information is given. The yield of butadiene, the nature of the by-products, the actual operational conditions are an intimate function of the specific nature of the catalysts used. Many graphs, tables and considerations in Chapter I lose most of their meaning, since they are not related to specific catalysts. The publishers must undoubtedly realize that the withholding of such information markedly decreases the value and therefore the saleability of the book.

To summarize, the quality of the book is uneven; Chapter III on polymerizations is by far the best; the book as a whole is an excellent survey of the Russian literature on the subject.

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SPECIAL ARTICLES

THE MECHANISM OF THE VIRUCIDAL ACTION OF ASCORBIC ACID[1]

The virucidal activity of ascorbic acid has been reported against vaccina virus[2] and poliomyelitis.[3] Knight and Miller[4] have recently demonstrated the virucidal activity of this compound against influenza A virus. We have confirmed the virucidal action of ascorbic acid against influenza A virus and will report our results indicating the mechanism of action of this compound.

Barron, DeMeio and Klemperer[5] have shown that the oxidation of ascorbic acid in air is catalyzed by Cu and they postulated that H_2O_2 is formed during the reaction. In the presence of 0.0002 mM of $CuCl_2$, pH 6.95, the half oxidation of ascorbic acid occurred in 10.3 minutes. These workers did not demonstrate the actual presence of H_2O_2, which they indicated was difficult because of its rapid decomposition into water and oxygen. Lyman, Schultze and King[6] have reported that their qualitative tests indicated the presence of H_2O_2 during the Cu catalyzed oxidation of ascorbic acid in air.

If H_2O_2 is the active virucidal agent, then catalase, which acts specifically upon H_2O_2, should completely abolish the activity of ascorbic acid. It should also be possible to show that H_2O_2 itself, in concentrations

1 This investigation has been aided by a grant from the Josiah Macy Jr. Foundation.

2 I. J. Kligler and H. Bernkopf, *Nature*, 139: 965, 1937.

3 C. W. Jungeblut, *Jour. Exp. Med.*, 62: 517, 1935.

4 C. A. Knight and W. M. Stanley, *Jour. Exp. Med.*, 79: 291, 1944.

5 E. S. G. Barron, R. H. DeMeio and F. Klemperer, *Jour. Biol. Chem.*, 112: 625, 1936.

6 C. H. Lyman, M. O. Schultze and C. S. King, *Jour. Biol. Chem.*, 118: 757, 1937.