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### A review of: “Nonionic Surfactants”

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## BOOK REVIEW

### "Nonionic Surfactants"

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*Nonionic Surfactants* (1112 pages), edited by M. J. Schick and published by Marcel Dekker, Inc., New York, 1967, is the first volume of a projected series on surfactant science. This is a most timely and useful volume, embracing a field of rapidly advancing technology and growing theoretical interest. Most of the 31 authors of the 29 chapters are from the United States industrial laboratories, with other contributors from Germany, the United Kingdom, and Japan. The book is divided into sections on organic chemistry (433 pages), physical chemistry (390 pages), analytical chemistry (96 pages), and biological aspects (74 pages) of nonionic surfactants. It will be useful to a wide range of scientists, including those in the fields of organic, physical, and polymer chemistry, detergents, textiles, pharmaceuticals, and medicine and environmental health.

In its treatment of water-dispersible polymers and copolymers of ethylene oxide, including modifications which show different degrees of surfactant activity, the book covers an interesting area of polymer chemistry which has not been adequately treated previously.

Also, recent technical developments are emphasized, including biodegradation of nonionics, phosphate esters of polyoxyethylenes, cationic derivatives of polyoxyethylenes, foam boosters, and iodophors and other medical applications. The self-siphoning water solutions of high molecular weight ethylene oxide polymers, very recently publicized from California, should increase interest in

the excellent chapter by Bailey and Koleske on polyoxyethylene chains in solution. This chapter discloses the limited chemical stability of ethylene oxide high polymers in water solution, which can be improved by addition of 2 to 5% isopropanol. Hydrogen bonding is used here and in other parts of the book to explain "complex" formation, but the reviewer calls attention also to the Lewis basic (electron-donating) properties of ether groups toward Lewis acidic species such as iodine in formation of "complexes" or "Lewis salts." Perhaps a new word should be proposed to replace those in quotation marks.

By far the largest part of the book treats ethylene oxide derivatives, the industrial application of which began in the early 1930s with the work of Schoeller, Schuette, Wittwer, and co-workers of Badische Anilin und Soda Fabrik, Ludwigshafen, Germany. Besides the additional polymerization products of ethylene oxide with phenols, alcohols, and other compounds containing active hydrogen, some of their ionic derivatives, such as sulfate and phosphate esters, have been discussed. Lists (and sometimes compositions) of the more familiar trade names have been included; a note at the beginning of the subject index gives their locations in the text.

The editor has been successful in achieving an appropriate balance, although there is a tendency for the more important industrial types such as alkyl phenol-ethylene oxide compounds to be treated in less than appropriate detail. Some of the early chapters do not give the basic IG patents, although these are cited in Chapter 6, "Polyoxyethylene Mercaptans."

The excellent format, printing, and freedom from typographical errors in this book are unusual in current technical publications.

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