

The chapters lead logically from Physical Properties, through the theory of Emulsion Stability, Creaming, Inversion, and Demulsification. The selections of references to illustrate these phases of the subject were the outstanding contributions to this literature, and were knowledgeably handled. The chemistry of emulsifying agents includes a discussion based on the Schwartz and Perry classification and considers emulsifier efficiency and pertinent experimental data on this important phase of application.

Important to the experimenter is the chapter on Techniques: Good coverage of procedures and equipment is apparent. Current Applications are well authenticated and are either described by formulas and suggested method of preparation, or by wise selection of literature references. Though well presented, this chapter could have been expanded considerably, for this is the practice of the art about which so much has been written. A chapter on Demulsification in practice provides a short summary of the various applications in this specialty portion of the field.

Carefully prepared appendices round out the treatment of the subject: Appendix A, Testing of Emulsion Properties, devotes considerable space to surface and interfacial tension measurement; includes methods for measurement of viscosity, surface, and interfacial viscosity; determination of emulsion type; droplet size; stability; and several miscellaneous measurements. Appendix B, Commercially Available Emulsifying Agents, is a knowledgeable selection from the hundreds of surfactants on the market.

This book is recommended as a well-designed tool for one interested in theory, can be very useful from the application viewpoint, and has been planned for ease of usage.

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Rubber, Fundamentals of Its Science and Technology. J. LE BRAS, translated by IRENE E. BERCK. Chemical Publishing Co., New York, 1958. 464 pp. \$12.00.

This book is based on a course of lectures first given in 1941 by Professor Le Bras at the French Rubber Institute for the purpose of training rubber engineers and technicians in the research department of the institute. The subject matter has been revised and modernized since that time. The chapter titles are: General Aspects; Sources and Preparation of Natural Rubber; The Composition and Properties of Latex;

The Physical Properties of Rubber; The Chemical Composition and Structure of Rubber; The Chemical Properties of Rubber; Vulcanization; Compounding Ingredients and Their Application; Processing of Rubber; Direct Application of Latex; Theoretical Aspects of Rubber Chemistry; Synthetic Rubbers; Analyses and Tests for Latex and Rubber; Hard Rubbers, Reclaimed Rubbers, and Chemical Rubber Derivatives; Applications of Rubber.

As might be expected, the emphasis of the book is strongly on the practical. The properties of natural rubber and its processing, vulcanization, and testing are discussed with an ease and authority which bespeaks the author's long experience with these aspects of rubber science. The treatment of synthetic rubbers, while brief, is very useful and an effort has evidently been made to make it as up to date as possible. The discussion is very simple, for the most part, so that readers with only an elementary knowledge of chemistry should be able to follow it without difficulty. Readers of greater scientific sophistication will still find much that is helpful and valuable in the more technological sections of the book.

Unfortunately, in its more theoretical phases the book is considerably less successful. To do the author justice, it must be said that this phase of the subject was deliberately de-emphasized. Nevertheless, there are omissions which are difficult to understand. For example, there are only two very brief references to the use of infrared in the elucidation of rubber structure (the index lists only one reference), and no discussion or illustration of this important technique. Again, the reader interested in the molecular weight of rubber will find no mention of the light-scattering method for its determination, and will be led to believe that he must ordinarily rely on viscometry (no reference given later than 1926) or osmotic pressure. There is no discussion of molecular weight distributions and averages. A particular effort is made to treat the theory of vulcanization of rubber in some detail, because of its obvious importance, but the discussion is disappointing. Considerable space is given to outmoded theories, a tendency noticeable elsewhere in the book, while Farmer's work, which forms the basis of our modern understanding (such as it is) of sulfur vulcanization, is dismissed in three lines.

This book can be recommended to those who wish to know something of the technology of rubber, and either know already or are willing to neglect the more fundamental aspects of the field. It is well printed and relatively free from typographical errors, but is rather unattractively bound.

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