Table I—Concentration of Amikacin in Serum Following a Bolus Subcutaneous Injection

Time, hr	Amikacin Concentration, μg/ml Experimental	Predicted Value
0.5	315	345
1.0	270	244
2.0	132	121
4.0	25	29
6.0	8	7

Table II—Concentration of Amikacin in Cochlear Perilymph Following a Bolus Subcutaneous Injection

Time, hr	Amikacin Concentration, μg/ml Experimental	Predicted Value
0.5	2.0	2.2
1.0	6	5.7
2.0	9	9.1
4.0	10	9.2
6.0	7	7.0
12.0	2.5	2.1

equation, which is the form prescribed by Eq. 6 and is also as many exponential terms as can confidently be generated for six data points:

$$C_{\text{perilymph}}(t) = 29e^{-0.2169t(\text{in hr})} - 32e^{-0.6019t(\text{in hr})}$$

in micrograms per milliliter

The experimental data and corresponding predicted values are listed in Table II. For both the serum and perilymph, the equations fit the data well.

If the model is appropriate, the values of k_{10} estimated from each of these two equations should be equal. The estimate of k_{10} from the serum drug concentration *versus* time equation is the exponent of the single exponential term, 0.6992 hr^{-1}. The estimate of k_{10} from the perilymph drug concentration *versus* time equation is the exponent for the exponential term with a negative coefficient, 0.6019 hr^{-1}. These estimates show a 16% difference. Such a small difference is within the limits of accuracy expected in such an experimental setting. The close agreement provides evidence of the validity of the model. This model might be found useful in describing other small anatomic compartments of pharmacological interest.

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BOOKS

REVIEWS

Encyclopedia of Emulsion Technology, Vol. 1: Basic Theory. Edited by PAUL BECHER. Marcel Dekker, Inc., New York, NY 10016. 1983. 744 pp. 17 × 25 cm. Price $95.00 (20% higher outside the U.S. and Canada).

This book is the first in a series of volumes devoted to various aspects of emulsion science and technology. It contains one of the most comprehensive and authoritative reviews of the basic principles underlying emulsification and emulsion properties now available. Each chapter has been prepared by individuals actively involved in the area about which they have written. The editor, himself widely recognized for his work with emulsions, has done an excellent job in bringing this work together in a well-edited volume.

The book contains nine chapters, all developed at a fairly fundamental level. In Chapter 1, the authors provide an excellent review of basic interfacial chemistry and physics using the oil–water interface as the main focus. The next two chapters address the fundamentals of emulsion formation and stabilization. The former is an extremely unique and in-depth treatment of droplet formation and coalescence and the underlying fluid dynamics involved, while the latter represents the most complete and up-to-date fundamental discussion of emulsion stability that this reviewer has seen.

The remaining chapters provide excellent in-depth coverage of such topics as: microemulsions, phase equilibria and phase inversion temperatures, particle size evaluation, rheology, optical properties, and dielectric properties. The chapter on rheology, written by P. Sherman, presents material which should be read by anyone seriously concerned with the complex problems of evaluating emulsion product stability. The material on the viscoelastic properties of emulsions is particularly relevant for this purpose. The very long chapter on the fundamental dielectric properties of emulsions (over 200 pages) is a unique resource of information which offers interesting possibilities for evaluating emulsion behavior in a new way. The proportion of the book devoted to this chapter, however, is much too large, relative to the importance of the other subjects presented. As in this latter chapter, all of the material in this volume is treated at a fairly fundamental level with the assumption that the reader has a reasonably good basic background in the physical chemistry of surfaces and disperse systems. Consequently, this book should be thought of as primarily suitable for a graduate-level course dealing with emulsions or for the pharmaceutical scientist seriously prepared to approach this subject at a very fundamental level.

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