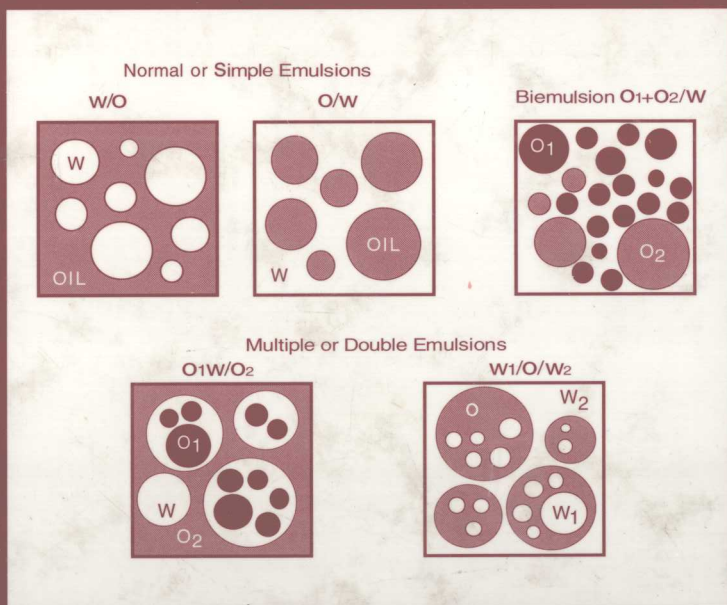


# Pharmaceutical Emulsions and Suspensions



edited by  
Françoise Nielloud  
Gilberte Marti-Mestres

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## Preface

Numerous books dealing with emulsions and suspensions focus on surfactants and formulations, generally in such fields as agronomy, food sciences, and the paint and petroleum industries. Much less attention has been paid to pharmaceutical systems, which are unique and more specific in their applications, toxicity, health hazards, drug delivery, and legislation. In fact, there is no comprehensive and practical text available on this subject, notwithstanding the great demand. This book has been written to remedy this situation.

Pharmaceutical dispersed systems such as suspensions and emulsions are among the most used dosage forms. They are utilized for all routes of administration—oral, topical, parenteral, mucosal, and ophthalmic. These forms effectively present many significant advantages such as an easy dividing up of the forms for pediatric and geriatric patients. The reduction of drug particle size allowed by these formulations enhances the bioavailability of the active agents. Moreover, colloidal particles, such as microparticles, nanospheres, emulsions, and liposomes, have been developed as promising carrier systems for the delivery or the targeting of drugs. Emulsions are also particularly attractive as a vehicle for the administration of poorly soluble drugs.

Liquid-liquid and solid-liquid dispersed systems are complicated forms from a physicochemical point of view, because of the presence of two phases. Their formulation therefore necessitates comprehension of fundamental aspects controlling the behavior of these systems. With this end in view, we begin this volume with theoretical considerations concerning pharmaceutical surfactants, formulation concepts, and emulsion properties, and the related know-how to attain them. As the text progresses, each chapter becomes more advanced and specific. Thermodynamic and kinetic aspects of suspension formulations, as well as

physicochemical properties leading to the stability of these systems, are described. An up-to-date analysis of emulsion applications as drug delivery systems is proposed. Most important are chapters describing the use of emulsions and suspensions with respect to the routes of administration. For example, the use of an emulsion or a nanosuspension may allow a poorly water-soluble drug to be administered parenterally or in an ophthalmic delivery system. Topical, transdermal, and gastrointestinal routes are also envisaged. The last part of this book is devoted to experimental designs. This methodology offers an excellent approach for the formulation of emulsions and suspensions. It reduces the expenditure of time and money by limiting the number of manipulations while retaining a very high quality of information. Finally, important aspects of dispersed systems stability are explored, such as rheology and determination of particle size.

As the editors of this volume—which represents the first complete coverage of pharmaceutical emulsions and suspensions—we chose the chapter authors on the basis of their experience and high degree of competence. The book should be useful to pharmacists, graduate students in the pharmaceutical sciences, professionals working in industrial research and development, and all those concerned with the health aspects of emulsions, suspensions, and dispersed systems.

In summary, this book covers fundamental and applied knowledge of emulsions and suspensions. It is hoped that it will provide much of the information and directions necessary to assist those working in all spheres of pharmacy in solving the difficult problems posed by emulsion and suspension formulations and applications.

We are grateful to all the contributors for their invaluable work and Marcel Dekker, Inc., for its competent collaboration.

*Françoise Nielloud  
Gilberte Marti-Mestres*

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