

considerations that must be made so that the conversion of a drug to a medicine can take place. It emphasizes the fact that medicines are very rarely drugs alone but require additives (termed excipients) to make them into dosage forms, and this in turn introduces the concept of formulation. The book explains that there are three major considerations in the design of dosage forms:

1. the physicochemical properties of the drug itself
2. biopharmaceutical considerations, such as how the administration route of a dosage form affects the rate and extent of drug absorption into the body, and
3. therapeutic considerations of the disease state and patient to be treated, which in turn determine the most suitable type of dosage form, possible routes of administration and the most suitable duration of action and dose frequency for the drug in question.

The first chapter provides an excellent introduction to the subject matter of the book as a whole and clearly justifies the need for the pharmacist and formulation scientist to understand the science contained in this text. New readers are encouraged to read this chapter first, thoroughly and carefully, so that they can grasp the basics of the subject before proceeding onto the more detailed information that follows.

The book is then divided into various Parts that group together chapters into related subject areas. Part 1 collects some of the more important physicochemical knowledge that is required to design and prepare dosage forms. The chapters have been designed to give the reader an insight into those scientific and physicochemical principles that are important to the formulation scientist. These chapters are not intended as a substitute for a thorough understanding of physical chemistry and many specific, more detailed, texts are available containing this information.

For many reasons, which are discussed in the book, the vast majority of dosage forms are administered via the mouth in the form of solid products, such as tablets and capsules. This means that one of the most important stages in drug administration is the dissolution of solid particles to form a solution in the gastrointestinal tract. The formulation scientist therefore needs knowledge of both liquid and solid materials, in particular the properties of drugs in solution and the factors influencing their

dissolution from solid particles. Once solutions are formed, the formulation scientist must understand the properties of these solutions. The reader will see later in the book how drug release from the dosage form and absorption of the drug by the body are strongly dependent on the properties of the drug in solution, such as the degree of dissociation and speed of diffusion of the drug molecules.

The properties of surfaces and interfaces are described next. These are important to an understanding of adsorption onto solid surfaces, and are involved in the dissolution of solid particles and the study of disperse systems, such as colloids, suspensions and emulsions. The scientific background to the systems mentioned is also discussed. Knowledge of the flow properties of liquids (whether solutions, suspensions or emulsions) is useful in solving certain problems relating to the manufacture and performance of solutions and semi-solids as dosage forms in their own right. This Part ends with an explanation of the kinetics of many different processes. As the chapter explains, the mathematics of these processes has importance in a large number of areas of product design, manufacture, storage and drug delivery. Relevant processes include: dissolution processes, microbiological growth and destruction, biopharmaceutics (including drug absorption, distribution, metabolism and excretion), preformulation, the rate of drug release from dosage forms, and the decomposition of medicinal compounds and products.

Part 2 collects together those aspects of pharmaceutics associated with powdered materials. By far the majority of drugs are solid (mainly crystalline) powders and, unfortunately, most of these have numerous adverse characteristics that must be overcome during the design of medicines to enable their satisfactory manufacture and subsequent performance in dosage forms.

The book therefore explains the concept of the solid state and how the internal and surface properties of solids are important and need to be characterized. This is followed by an explanation of the more macroscopic properties of powders that influence their performance during the design and manufacture of dosage forms – particle size and its measurement, size reduction and separation of powders with the desired size characteristics from those of other sizes. There follows an explanation of the many problems associated with the mixing and flow of powders. In large-scale tablet and capsule production, for example, powders must contain a