

Book reviews

Freeze-drying/Lyophilization of Pharmaceutical and Biological products

L. Rey and J. May (Eds), Marcel Dekker, Inc., New York, ISBN 0-8247-1983-2

Nowadays, in the pharmaceutical field, there is a great number of substances which need to be stored in a dry state due to their instability in the presence of water, for example, the antibiotics, vaccines, peptides and proteins. The aim of this book is to give a large spectrum of information on freeze-drying, with the understanding that researchers now have, 100 years after the discovery of this procedure. The book is organized on a contributed chapter basis. The contributors range from theoreticians to experts with considerable practical experience.

The first chapter brings the basics of freeze-drying to the reader. The next two chapters are essentially dedicated to a better understanding of the leading role of water in this process. Chapter four gives precise and practical information on the procedures and equipment used for freeze-drying. The following two chapters raise questions concerning protein structure protection and stabilization during lyophilization. Chapter seven concerns the residual moisture, in particular with respect to the levels required to maintain viability, immunological potency, or integrity of biological products. The next chapter presents the strategies required to preserve microorganisms during the freezing and drying steps. Here, emphasis is given to the different additives that can be added to the preparations. Chapter nine presents the chemical engineering and thermodynamic aspects of freeze-drying in the pharmaceutical industry. Several aspects are presented and among them, the equipment specifications required. Chapter ten is devoted to freeze-drying of vaccines. Chapter twelve raises the problems of process validation. This chapter is very informative and a survey of all critical process parameters is presented. The last chapters are dedicated to specific aspects such as elastomeric closures, cleaning-in-place and sterilization-in-place processes. Finally, Louis Rey presents some possible future applications such as semi-continuous and continuous processes, which are already used in the food industry, but which require some improvements if the standards of sterility are to be achieved.

As mentioned by the editors, this book will be useful for potential users of freeze-drying in the pharmaceutical industry. It is however, also very useful for academic researchers who want to have a better understanding of a very important

process for all pharmaceutical and biological products that need to be stored in a dry state.

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PII: S0939-6411(00)00140-5

Frontiers in Biomedical Polymer Applications (Vols. I and II)

Raphael M. Ottenbrite (Ed.), American Technical Publishers Ltd., England, UK. Vol. I: 1998, 317 pages, £131, ISBN: 1-56676-577-3; Vol. II: 1999, 238 pages, £115, ISBN: 1-56676-714-8

Biomedical polymers are used for a tremendous number of different applications. These applications reach from their use as raw materials for prostheses to experimental applications that emerged during the last couple of years such as tissue engineering. It is more than obvious that there are numerous points of view that one might take when having a look at the multitude of biomedical polymers that can be used for this myriad of applications. There are, for example, the aspects of surface properties of materials that are decisive for applications such as drug targeting, issues of biocompatibility a property that we require in general for biomaterials and even efficient ways of synthesis that will provide us with new polymers.

What does 'Frontiers in Biomedical Polymer Applications' focus on? The focus is on none of these fields and all of them at the same time. The book is an excellent snapshot of a scientific field that is currently changing very rapidly. Forty one groups present results from their research on biomedical polymers. The contributions cover a number of up to date scientific issues. Among them are: materials for drug delivery, biodegradable polymers, polyelectrolytes, materials surface aspects, non-viral gene therapy and many more.

Prospective readers who may profit from the books are to some extent scientists who are not yet working in the field. 'Frontiers in Biomedical Polymer Applications' gives them an impression of potential applications for biomedical materials and of the science and problems that are still ahead of us in this field. The books can be of interest to all those who are not familiar with biomaterials but who are working with