

Advances in Delivery Science and Technology

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Analytical Techniques in the Pharmaceutical Sciences

 Springer

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Preface

Progress in all areas of the pharmaceutical sciences, from drug discovery and biopharmaceutics to drug delivery and pharmaceutical technology, has long been strongly connected to the development and application of analytical techniques. Without the development of HPLC and its application to plasma samples, there would be no plasma concentration time curves and no development of the concept of bioavailability. Without solid-state analytical techniques, like X-ray powder diffraction and thermal analysis, the importance of the solid-state form of a drug on its pharmaceutical performance could not have been studied, let alone understood, to name but two examples. This list could continue endlessly. But analytical techniques have also evolved as pharmaceutical questions have been more clearly stated. An example for this is the continuous development of dissolution testing, initially used for the quality control of dosage form, to now also having physiologically relevant dissolution testing aiming to understand the performance of a dosage form *in vivo*.

This book brings together a large range of analytical techniques of specific relevance to the pharmaceutical sciences. The techniques are introduced to understand their theoretical background, but also to highlight their pharmaceutical applications. The book therefore, we hope, is equally interesting and enlightening for skilled experts in the field of pharmaceutical sciences, as for young and beginning researchers, including undergraduate and postgraduate students.

In our attempt to try to bring order into the plethora of analytical techniques available today for the pharmaceutical scientist, we have divided the techniques in this book according to their principle of measurement. The reader will find chapters on spectroscopic techniques, diffractometric techniques, thermal techniques, separation techniques, and many more. Whilst many methods probing the molecular, particulate and bulk level are included, we are not claiming to have covered all techniques available. We have aimed to collect the major techniques of particular value to the pharmaceutical scientist today, techniques that formed the basis and introduced other techniques. We further elaborate by explaining how their use in drug and dosage form research should be facilitated.

The pharmaceutical sciences and the analytical sciences will continue to be intertwined in a fruitful and beneficial co-evolution ultimately to the benefit of patients and society. We hope that through you, the reader, this book can make a small contribution to this.

Copenhagen, Denmark
Glasgow, UK
Copenhagen, Denmark

Anette Müllertz
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His studies combine the physical, chemical, and biological sciences and technology with analytics to optimally formulate drugs and vaccines.