ULTRATRACE ANALYSIS OF PHARMACEUTICALS AND OTHER COMPOUNDS OF INTEREST

Edited by
Satinder Ahuja

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PREFACE

Ultratrace analysis, simply defined, entails any analysis performed below trace levels. Analysis carried out at parts per million or microgram amounts is frequently considered trace analysis. For the purpose of this book, analyses performed at submicrogram levels are considered ultratrace analyses. Therefore, coverage is provided primarily for such methodologies and their applications. Some analyses carried out at microgram levels in complex matrices in forensic or animal feed samples are also included because they are beyond what is ordinarily considered trace analysis in those fields.

Ultratrace analyses are highly specialized and complicated. Therefore, experts from various fields were invited to write about the analyses performed at the lowest level in their respective fields. This book not only covers analyses performed in a variety of areas, but also highlights how these analyses are instrumental in solving some of the complex scientific problems pertaining to mode of action of drugs and safety of our food, water, and environment.

The object of this book is to provide a ready reference to methodologies that are used in different related fields to allow optimal method selection. This may not be ordinarily possible since researchers tend to review primarily literature in their own fields. Yet the information a pharmaceutical analyst seeks might be available from a clinical chemist or environmental chemist. As a matter of fact, ultratrace analyses are performed by clinical, forensic, environmental, and food chemists, and other researchers involved in determining mechanism of action, disposition, and toxic properties of chemicals. This book was planned to provide valuable sources of information from a variety of fields with sufficient methodological details to allow methodology evaluation.

The first portion of this book includes six chapters detailing methodologies commonly used for ultratrace analyses: derivatization chromatography, selected ion-monitoring including MS/MS, liquid chromatography including LC/MS, modern thin layer chromatography, and atomic spectrometry. Since immunoassays provide selective applications, they are appropriately covered in Chapter 9 on analysis of drugs and their metabolites.

Applications of ultratrace analyses are covered in the second part of the book. The concern for purity of pharmaceutical compounds and excipients is addressed in two separate chapters. The next two chapters highlight how

ultratrace analyses help in the performance of metabolic and toxicological studies. The last three chapters deal with the importance and applications of these analyses in the use and abuse of drugs in animals and humans.

I wish to express my sincere appreciation to all the authors for their valuable contributions to this volume. Special thanks are due to my father, Jawahar Lal, and my mother, Sushil Vati, for providing inspiration, and my wife, Fay, for helping in many ways.

SATINDER AHUJA

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