

COMPREHENSIVE ORGANOMETALLIC ANALYSIS

T. R. Crompton

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PREFACE

It is now some sixteen years since the author's first series of books on the analysis of organometallic compounds. Many developments in the subject have occurred since that time and a new book on the subject is now overdue.

The present book aims to provide a comprehensive review of the subject. It covers not only all aspects of the analysis of organometallic compounds but also contains two additional chapters, dealing with environmental analysis and the use of chelates of metals in the determination of very low concentrations of organic metals.

Whilst reviewing the literature for the present book, it was observed that whereas papers published prior to 1973 dealt almost exclusively with various forms of analysis, a high proportion of those published during the past ten years were concerned with the application of proven or newly developed methods to the determination of organometallic compounds in environmental samples such as water, air, soil, river and ocean sediments, fish life and biota samples. An increasing range of elements including mercury, lead, arsenic, tin, antimony, selenium and manganese are now being found in organically bound forms in the environment, some resulting from pollution, others formed in nature by bacterial processes. As many of these substances have appreciable implications to human and animal health and the ecosystem as a whole, it was considered that it would be timely to include a separate chapter in the book devoted entirely to this subject.

Many elements, upon reaction with particular chelating agents, produce chelates which are amenable to chromatographic analysis and, in many cases, are sufficiently volatile to be gas chromatographed. This has opened up a whole new area of analysis of mixtures of metals at very low concentrations.

In many instances chelate formation-gas chromatographic methods have absolute detection limits several orders of magnitude lower than those achieved by competing techniques such as atomic absorption, neutron activation analysis, emission spectrography and spark-source mass spectrometry.

The purpose of this separate chapter is to gather together the world literature on this new subject so as to enable analytical chemists to take

a strong interest in and develop further, the technique which, in the opinion of the author, has even greater potential in the future.

The first seven chapters of the book cover each of the major analytical techniques that can be applied to the analysis of organometallic compounds. Within each chapter, the elements are discussed in alphabetical order. The first two chapters cover the determination of elements and functional groups. Succeeding chapters, respectively, cover the applications of titration techniques, visible and ultra-violet spectroscopic techniques, other spectroscopic techniques particularly infrared, NMR, PMR, etc., polarography, gas chromatography and finally a chapter covering other chromatographic techniques.

Errors are inevitable in a work of this size; the author would be grateful to receive notification of any errors so that they can be rectified in future editions.

It is hoped that this book will serve its aim of being a source-book of all aspects of the analysis of organometallic compounds, their occurrence in the environment and their uses in analytical chemistry.

The volumes will interest workers in a wide variety of fields both industrial and academic, at both the pure and the applied ends of the subject. In addition to analytical chemists the book will be of interest to organic chemists and those concerned with the environment and public health. Organometallic chemistry is a field which continues to grow and to which students should direct their interest and it is hoped that they will find much to interest them.

T. R. Crompton

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FIGURE

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