

CONTENTS

Preface	xi
A Tribute to Arthur D. F. Toy: A Life of Dedication to Research in Industrial Chemistry	xiii
Research in Industrial Phosphorus Chemistry: A Reminiscence	xxix
1. The Role of Phosphorus in Chemistry and Biochemistry: An Overview	1
2. Cyclic Oxyphosphoranes: Models for Reaction Intermediates	18
3. Quantitative Analysis of Inorganic Phosphates Using ^{31}P NMR Spectroscopy	41
4. Phosphorus Atoms in Unusual Environments	56
5. Five-Coordinate and Quasi-Five-Coordinate Phosphorus	64
6. New Derivative Chemistry of Two-Coordinate Phosphines	76
7. Factors Influencing the Chain Lengths of Inorganic Polyphosphates	86
8. Mechanism of Reactions of Monosubstituted Phosphates in Water: Appearance and Reality	102
9. Ring Fragmentation Approaches to Low-Coordinate Phosphorus Species	115
10. Phosphoranide Anions (10-P-4) with Electronegative Apical and Electropositive Equatorial Ligands Coordinated to Metals To Form Symmetrical 10-P-5 Species	128
11. Photorearrangements of Allyl Phosphites	137
12. Mechanisms of the Wittig Reaction	149
13. Reaction of 2-Amino-4-Substituted Phenols with Aryl Phosphorodichloridates: Formation of a Novel Spirobis-(1,3,2-benzoxazaphosphote) System from an Unexpected Elimination of Aryloxy Moieties	162
14. Bis(diphenylphosphino)methane in Organometallic Synthesis: New Applications	173
15. Substituted 1,3,2 λ^5 -Dioxaphospholanes: New Synthetic Methodologies	186
16. DNA-The Ultimate Phosphorus Polymer: ^{31}P One- and Two-Dimensional NMR Spectroscopy of Oligonucleotides and Protein-DNA Complexes	202
17. Phosphorus Flame Retardants for a Changing World	218
18. Aryl Group Interchange in Triarylphosphines and Its Role in Catalyst Stability in Homogeneous Transition-Metal-Catalyzed Processes	229
19. Crystalline Chloro-Trisodium Orthophosphate	240
20. Development of Functional Organophosphorus Compounds	248
Author Index	277
Affiliation Index	278
Subject Index	278