

1. Record Nr.	UNINA9910141261103321
Autore	Kamer Paul
Titolo	Phosphorus(III) ligands in homogeneous catalysis [[electronic resource] ] : design and synthesis / / edited by Paul Kamer & Piet W.N.M. van Leeuwen
Pubbl/distr/stampa	Chichester, West Sussex, United Kingdom, : John Wiley & Sons, Ltd., 2012
ISBN	1-280-78471-7 9786613695109 1-118-29970-1 1-118-29971-X 1-118-29973-6
Descrizione fisica	1 online resource (567 p.)
Classificazione	TEC021000
Altri autori (Persone)	LeeuwenP. W. N. M. van (Piet W. N. M.)
Disciplina	541.2242 546.712595 546/.712595
Soggetti	Phosphorus compounds Ligands Catalysis TECHNOLOGY & ENGINEERING / Material Science Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Phosphorus( III ) Ligands in Homogeneous Catalysis: Design and Synthesis; Contents; List of Contributors; Preface; 1 Phosphorus Ligand Effects in Homogeneous Catalysis and Rational Catalyst Design; 1.1 Introduction; 1.2 Properties of phosphorus ligands; 1.2.1 Electronic ligand parameters; 1.2.2 Steric ligand parameters; 1.2.3 Bite angle effects; 1.2.4 Molecular electrostatic potential (MESP) approach; 1.3 Asymmetric ligands; 1.4 Rational ligand design in nickel-catalysed hydrocyanation; 1.4.1 Introduction; 1.4.2 Mechanistic insights; 1.4.3 Rational design; 1.5 Conclusions; References 2 Chiral Phosphines and Diphosphines 2.1 Introduction; 2.1.1 Early developments; 2.2 Chiral chelating diphosphines with a linking

scaffold; 2.2.1 Building chiral backbones from naturally available materials; 2.2.2 Design and synthesis of chiral backbones; 2.2.3 Synthesis from optical resolution of phosphine precursors or intermediates; 2.3 Chiral atropisomeric biaryl diphosphines; 2.3.1 Synthesis of BINAP and its derivatives; 2.3.2 Synthesis of atropisomeric biaryl ligands; 2.3.3 General strategies of synthesizing of atropisomeric biaryl ligands; 2.4 Chiral phosphacyclic diphosphines  
2.4.1 Fundamental discovery and syntheses of BPE and DuPhos  
2.4.2 Design and synthesis of bisphosphetanes; 2.4.3 Design and synthesis of bisphospholanes; 2.4.4 Design and synthesis of bisphospholes; 2.4.5 Design and synthesis of bisphosphinanes; 2.4.6 Design and synthesis of bisphosphepines; 2.4.7 Summary of synthetic strategies of phosphacycles; 2.5 P-stereogenic diphosphine ligands; 2.6 Experimental procedures for the syntheses of selected diphosphine ligands; 2.6.1 Synthesis procedure for DIOP\* ligand; 2.6.2 Synthesis procedure of SDP ligands; 2.6.3 Synthesis procedure of (R,R)-BICP  
2.6.4 Synthesis procedure of SEGPHOS  
2.6.5 Synthesis procedure of Ph-BPE; 2.6.6 Synthesis procedure of TangPhos; 2.6.7 Synthesis procedure of Binaphane; 2.7 Concluding remarks; References; 3 Design and Synthesis of Phosphite Ligands for Homogeneous Catalysis; 3.1 Introduction; 3.2 Synthesis of phosphites; 3.2.1 Monophosphites; 3.2.2 Diphosphite ligands; 3.2.3 Triphosphites; 3.3 Highlights of catalytic applications of phosphite ligands; 3.3.1 Hydrogenation reactions; 3.3.2 Functionalization of alkenes: hydroformylation and hydrocyanation  
3.3.3 Addition of nucleophiles to carbonyl compounds and derivatives  
3.3.4 Allylic substitution reactions; 3.3.5 Miscellaneous reactions; 3.4 General synthetic procedures; 3.4.1 Symmetrically substituted phosphites; 3.4.2 Nonsymmetrically substituted phosphites; 3.4.3 Phosphites bearing dioxaphospho-cyclic units; References; 4 Phosphoramidite Ligands; 4.1 Introduction; 4.1.1 History; 4.2 Synthesis of phosphoramidites; 4.3 Reactivity of the phosphoramidites; 4.4 Types of phosphoramidite ligands; 4.4.1 Acyclic monodentate phosphoramidites; 4.4.2 Cyclic monodentate phosphoramidites based on diols  
4.4.3 Cyclic phosphoramidites based on amino alcohols

---

## Sommario/riassunto

"Over the last 60 years the increasing knowledge of transition metal chemistry has resulted in an enormous advance of homogeneous catalysis as an essential tool in both academic and industrial fields. Remarkably, phosphorus(III) donor ligands have played an important role in several of the acknowledged catalytic reactions. The positive effects of phosphine ligands in transition metal homogeneous catalysis have contributed largely to the evolution of the field into an indispensable tool in organic synthesis and the industrial production of chemicals. This book aims to address the design and synthesis of a comprehensive compilation of P(III) ligands for homogeneous catalysis. It not only focuses on the well-known traditional ligands that have been explored by catalysis researchers, but also includes promising ligand types that have traditionally been ignored mainly because of their challenging synthesis. Topics covered include ligand effects in homogeneous catalysis and rational catalyst design, P-stereogenic ligands, calixarenes, supramolecular approaches, solid phase synthesis, biological approaches, and solubility and separation. Ligand families covered in this book include phosphine, diphosphine, phosphite, diphosphite, phosphoramidite, phosphonite, phosphinite, phosphole, phosphinine, phosphinidenene, phosphalkenes, phosphalkynes, P-chiral ligands, and cage ligands. Each ligand class is accompanied by detailed and reliable synthetic procedures. Often the rate limiting step in the application of ligands in catalysis is the synthesis of the ligands

themselves, which can often be very challenging and time consuming. This book will provide helpful advice as to the accessibility of ligands as well as their synthesis, thereby allowing researchers to make a more informed choice. Phosphorus(III) Ligands in Homogeneous Catalysis: Design and Synthesis is an essential overview of this important class of catalysts for academic and industrial researchers working in catalyst development, organometallic and synthetic chemistry"--

---