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2.2.2 Water as a Solvent and Ligand; 2.2.3 Organometallic Reactions of Water; 2.2.4 Catalytic Reactions with Water; 2.2.4.1 Water-gas Shift Reaction; 2.2.4.2 Wacker- Hoechst Acetaldehyde Process; 2.2.4.3 Olefin Hydration; 2.2.4.4 Hydrodimerization; 2.2.5 Water-soluble Metal Complexes; 2.2.6 Perspectives; 2.3 Characterization of Organometallic Compounds in Water; 2.3.1 Introduction; 2.3.2 General Survey 2.3.3 Effect of High Hydrostatic Pressure on Aqueous Organometallic Systems 2.3.4 Aqueous Organometallics with Pressurized Gases; 2.3.5 Concluding Remarks; 3 Catalysts for an Aqueous Catalysis; 3.1 Variation of Central Atoms; 3.1.1 Transition Metals; 3.1.1.1 Introduction; 3.1.1.2 Water-soluble Catalysts by Virtue of Water-soluble Ligands; 3.1.1.3 Water-soluble Catalysts through Water Coordination; 3.1.2 Lanthanides in Aqueous-phase Catalysis; 3.1.2.1 Introduction; 3.1.2.2 Aldol Reactions; 3.1.2.3 Mannich-type Reactions; 3.1.2.4 Diels - Alder Reactions; 3.1.2.5 Micellar Systems 3.1.2.6 Asymmetric Catalysis in Aqueous Media 3.1.2.7 Conclusions; 3.2 Variation of Ligands; 3.2.1 Monophosphines; 3.2.1.1 General Features, Scope, and Limitations; 3.2.1.2 Anionic Phosphines; 3.2.1.3 Cationic Phosphines; 3.2.1.4 Nonionic Water-soluble Phosphines; 3.2.2 Diphosphines and Other Phosphines; 3.2.2.1 General; 3.2.2.2 Diphosphines - Introduction of Sulfonate Groups by Direct Sulfonation; 3.2.2.3 Introduction of Sulfonate Groups During Synthesis; 3.2.2.4 Diphosphines with Quaternized Aminoalkyl or Aminoaryl Groups; 3.2.2.5 Diphosphines with Hydroxyalkyl or Polyether Substituents 3.2.2.6 Carboxylated Diphosphines 3.2.2.7 Amphiphilic Diphosphines; 3.2.2.8 Other Phosphines; 3.2.3 Ligands or Complexes Containing Ancillary Functionalities; 3.2.3.1 Complexes Containing at Least Two Classical Functionalities; 3.2.3.2 Cationic Complexes; 3.2.3.3 Immobilization on Silica Supports; 3.2.3.4 Macromolecular Ligands or Supports; 3.2.3.5 Ligands not Containing Phosphorus; 3.2.3.6 Additional Perspectives; 3.2.4 Tenside Ligands; 3.2.4.1 Introduction; 3.2.4.2 Tenside Phosphines and Amines; 3.2.4.3 Hydroformylation Reactions Catalyzed by Transition Metal Surfactant - Phosphine Complexes 3.2.4.4 Hydrogenation Reactions Catalyzed by Transition Metal Surfactant - Phosphine Complexes

Sommario/riassunto

Now in its second completely revised and expanded edition. Written by the renowned editors B. Cornils and W. A. Herrmann, this book presents every important aspect of aqueous-phase organometallic catalysis, a method which saves time, waste and money. The large-scale application of this "green" technology in chemical industry clearly underlines its practical use outside of academia. New chapters (for example "Organic Chemistry in Water"), 20% more content and fully updated contributions from by a plethora of international authors make this book a "must-have" for everyone working in thi