

1. Record Nr.	UNINA9911019631803321
Titolo	Mechanisms in homogeneous catalysis : a spectroscopic approach // edited by Brian Heaton
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2005
ISBN	9786610520046 9781280520044 1280520043 9783527604876 3527604871 9783527605132 3527605134
Descrizione fisica	1 online resource (406 p.)
Altri autori (Persone)	HeatonBrian, Dr.
Disciplina	543.5 660.2995
Soggetti	Catalysis Activation (Chemistry)
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	Mechanisms in Homogeneous Catalysis; Preface; Contents; List of Contributors; 1 NMR Spectroscopy and Homogeneous Catalysis; 1.1 Introduction; 1.2 Reaction Mechanisms via Reaction Monitoring; 1.2.1 Detecting Intermediates; 1.2.2 Reaction Kinetics via NMR; 1.3 Structural Tools; 1.3.1 Chemical Shifts; 1.3.2 Coupling Constants; 1.3.3 NOE Spectroscopy and 3-D Structure; 1.4 Isotopes in Catalysis; 1.4.1 Kinetic Isotope Effect (KIE); 1.4.2 Structural Effects; 1.4.3 An Active Site Counting Method; 1.5 Dynamic NMR Spectroscopy; 1.5.1 Variable Temperature Studies; 1.5.2 Line Shape Analysis 1.5.3 Magnetization Transfer1.5.4 NOESY/EXSY/Hidden Signals; 1.6 Special Topics; 1.6.1 T(1) and Molecular H(2) Complexes; 1.6.2 Parahydrogen Induced Polarization (PHIP); 1.6.2.1 Hydrogenation Mechanism Studies; 1.6.2.2 Parahydrogen as a Magnetic Probe; 1.6.3 High Pressure NMR; 1.6.3.1 Introduction; 1.6.3.2 Applications; 1.6.4 Diffusion and Pulsed Gradient Spin Echo Measurements; References; 2

High Pressure NMR Cells; 2.1 Introduction; 2.2 High Pressure NMR of Liquids; 2.2.1 High Pressure, High Resolution Probes; 2.2.2 Glass and Quartz Capillaries; 2.3 High Pressure NMR of Supercritical Fluids 2.3.1 High Pressure, High Temperature NMR Probes 2.3.2 Toroid Probes for High Pressure NMR; 2.4 High Pressure NMR of Gases Dissolved in Liquids; 2.4.1 Sapphire Tubes; 2.4.2 High Pressure Probes for Pressurized Gases; 2.5 Conclusions, Perspectives; Acknowledgments; References; 3 The Use of High Pressure Infrared Spectroscopy to Study Catalytic Mechanisms; 3.1 Introduction; 3.2 Cell Design; 3.2.1 Transmission Cells; 3.2.1.1 Amsterdam Flow Cell; 3.2.1.2 Low-temperature HP IR Cells; 3.2.1.3 HP IR Cells for Flash Photolysis; 3.2.2 Reflectance Cells 3.3 Mechanistic Studies using High Pressure IR Spectroscopy 3.3.1 In situ Studies under Catalytic Conditions; 3.3.1.1 Methanol Carbonylation; 3.3.1.2 Hydroformylation; 3.3.1.3 Other Reactions of Carbon Monoxide; 3.3.2 Kinetic and Mechanistic Studies of Stoichiometric Reaction Steps; 3.3.2.1 Migratory CO Insertion Reactions of Metal Alkyls; 3.3.2.2 Substitution and Exchange Reactions of CO Ligands; 3.3.2.3 Exchange between Rh-D and H(2); 3.3.2.4 Hydrogenolysis of M-C Bonds; 3.3.2.5 Mechanistic Studies in Polymer Matrices; 3.3.2.6 Noble Gas and H(2) Complexes 3.3.2.7 Alkane Complexes and C-H Activation Reactions 3.4 Conclusions; References; 4 Processing Spectroscopic Data; 4.1 Introduction; 4.2 The Catalytic System; 4.2.1 Recycle CSTR with Analytics; 4.2.2 Physical System; 4.2.3 Chemical Description; 4.3 Experimental Design; 4.3.1 Transport Time-scales; 4.3.2 Reaction Time-scales; 4.3.2.1 Spectroscopic Measurements; 4.3.2.2 Time-scales for Spectroscopic Measurements; 4.3.3 The Meaning of "In Situ" Studies; 4.3.4 The Planning of Experiments; 4.3.4.1 Batch and Semi-batch; 4.3.4.2 Choice of Spectrometers; 4.3.4.3 Groups of Experiments 4.3.4.4 Range of Experiments

Sommario/riassunto

While chemists using spectroscopic methods need to learn from the specialists, they do not normally read the spectroscopists' original papers. This book provides this very information -- summarizing some recent advances in the mechanistic understanding of metallocene polymerization catalysts and the role of NMR spectroscopy in these endeavors. Adopting a real practice-oriented approach, the authors focus on two of the most important spectroscopic techniques with two parts devoted to each of NMR and IR spectroscopy - as well as on important industrial applications with regard to the reaction