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Titolo	Homogeneous catalysis with metal complexes [[electronic resource]] : kinetic aspects and mechanisms / / O.N. Temkin ; translated from the Russian by P.P. Pozdeev
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Descrizione fisica	1 online resource (832 p.)
Disciplina	541.395
Soggetti	Catalysis Metal catalysts Metal complexes
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 indexes.
Nota di contenuto	Homogeneous Catalysis with Metal Complexes; Contents; Notations and Abbreviations; Preface to English Edition; Preface; Acknowledgments; About the Author; Introduction; 1 State-of-the-Art in the Theory of Kinetics of Complex Reactions; 1.1 Main concepts of the Horiuti-Temkin theory of steady-state reactions; 1.1.1 Reaction mechanism: Stoichiometry and routes; 1.1.2 Kinetics: Reaction rates with respect to substances and over routes; 1.1.3 Kinetic polynomial; 1.1.4 Determining the number of independent parameters in a kinetic model. The problem of identifiability of parameters 1.2 Quasi-steady-state and quasi-equilibrium approximations in chemical kinetics1.2.1 Theoretical criteria of quasi-steady-state intermediate concentrations and quasi-equilibrium steps; 1.2.2 Experimental criteria of applicability of quasi-steady-state approximation in various systems; 1.3 Methods of graph theory in chemical kinetics and in theory of complex reaction mechanisms; 1.3.1 Linear mechanisms; 1.3.2 Nonlinear mechanisms; 1.3.3 Other fields of

application of kinetic and bipartite graphs in chemical kinetics and in theory of complex reaction mechanisms
1.4 Elementary steps - Selection rules1.4.1 Main postulates, laws, and principles; 1.4.2 Energy selection rules for elementary steps; 1.4.3 Quantum-chemical selection rules for elementary steps; 1.4.4 Topological selection rules for elementary steps; References; 2 Complexity Functions of Catalysts and Reactants in Reactions Involving Metal Complexes; 2.1 Mononuclear metal complexes; 2.1.1 Complexity functions: variants I and II; 2.1.2 Complexity functions: variants III and IV; 2.1.3 General problems and recommendations
2.2 Polynuclear complexes in homogeneous catalytic and noncatalytic reactions2.2.1 Systems with formation of associates; 2.2.2 Systems with mononuclear and polynuclear complexes of various types; 2.3 Catalysis with polynuclear copper(I) halide complexes in superconcentrated solutions; 2.3.1 Copper(I) chloride complexes in solution and in crystalline state; 2.3.2 Kinetics of catalytic reactions of alkynes in concentrated NH4Cl-CuCl aqueous solutions at constant complexity functions FCu and FCl; 2.3.3 Determination of compositions of catalytically active copper(I) complexes in various reactions
2.3.4 Studying p and s complexes of copper(I) with alkynes in crystalline state and in solution2.3.5 Mechanisms of acetylene dimerization and hydrocyanation reactions. Crystallochemical aspects; References; 3 Multi-Route Mechanisms in Reactions Involving Metal Complexes; 3.1 Factors accounting for the appearance and kinetic features of multi-route mechanisms; 3.2 Analysis of multi-route reaction kinetics; 3.3 Conjugation nodes and artificial multi-route character; 3.4 Conjugate processes; 3.4.1 Classical approach; 3.4.2 Kinetic and thermodynamic conjugation in consecutive reactions
3.4.3 Conjugation in chain reactions

Sommario/riassunto

Homogeneous catalysis by soluble metal complexes has gained considerable attention due to its unique applications and features such as high activity and selectivity. Catalysis of this type has demonstrated impressive achievements in synthetic organic chemistry and commercial chemical technology. Homogeneous Catalysis with Metal Complexes: Kinetic Aspects and Mechanisms presents a comprehensive summary of the results obtained over the last sixty years in the field of the kinetics and mechanisms of organic and inorganic reactions catalyzed with metal complexes. Topics covered in

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Autore	Hays Max
Titolo	Realizing an Andreev Spin Qubit : Exploring Sub-gap Structure in Josephson Nanowires Using Circuit QED / / by Max Hays
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ISBN	9783030838799 9783030838782
Edizione	[1st ed. 2021.]
Descrizione fisica	1 online resource (200 pages)
Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5061
Disciplina	621.3815
Soggetti	Quantum computing Semiconductors Solid state physics Computer science Quantum Information Electronic Devices Models of Computation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Part 1: Key concepts and contributions -- Chapter 1: Introduction -- Chapter 2: Andreev levels -- Chapter 3: Probing Andreev levels with cQED -- Chapter 4: Unlocking the spin of a quasiparticle -- Chapter 5: Future directions -- Part 2 The beautiful, messy details -- Chapter 6: BCS superconductivity -- Chapter 7: Andreev reflection, Andreev levels, and the Josephson effect -- Chapter 8: Andreev levels in Josephson nanowires -- Chapter 9: What would happen in a topological weak link? -- Chapter 10: The device -- Chapter 11: Spectroscopy and dispersive shifts -- Chapter 12: Raman transitions of the quasiparticle spin -- Chapter 13: Interactions of Andreev levels with the environment -- Chapter 14: Unexplained observations.
Sommario/riassunto	The thesis gives the first experimental demonstration of a new quantum bit (“qubit”) that fuses two promising physical implementations for the storage and manipulation of quantum

information – the electromagnetic modes of superconducting circuits, and the spins of electrons trapped in semiconductor quantum dots – and has the potential to inherit beneficial aspects of both. This new qubit consists of the spin of an individual superconducting quasiparticle trapped in a Josephson junction made from a semiconductor nanowire. Due to spin-orbit coupling in the nanowire, the supercurrent flowing through the nanowire depends on the quasiparticle spin state. This thesis shows how to harness this spin-dependent supercurrent to achieve both spin detection and coherent spin manipulation. This thesis also represents a significant advancement to our understanding and control of Andreev levels and thus of superconductivity. Andreev levels, microscopic fermionic modes that exist in all Josephson junctions, are the microscopic origin of the famous Josephson effect, and are also the parent states of Majorana modes in the nanowire junctions investigated in this thesis. The results in this thesis are therefore crucial for the development of Majorana-based topological information processing.