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Autore	Chen E. C. M (Edward C. M.)
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Nota di contenuto	THE ELECTRON CAPTURE DETECTOR AND THE STUDY OF REACTIONS WITH THERMAL ELECTRONS; CONTENTS; FOREWORD; PREFACE; 1. Scope and History of the Electron; 1.1 General Objectives and Organization; 1.2 General Scope; 1.3 History of the Electron; References; 2. Definitions, Nomenclature, Reactions, and Equations; 2.1 Introduction; 2.2 Definition of Kinetic and Energetic Terms; 2.3 Additional Gas Phase Ionic Reactions; 2.4 Electron Affinities from Solution Data; 2.5 Semi-Empirical Calculations of Energetic Quantities; 2.6 Herschbach Ionic Morse Potential Energy Curves; 2.7 Summary; References 3. Thermal Electron Reactions at the University of Houston3.1 General Introduction; 3.2 The First Half-Century, 1900 to 1950; 3.3 Fundamental Discovery, 1950 to 1960; 3.4 General Accomplishments, 1960 to 1970; 3.4.1 Introduction; 3.4.2 The Wentworth Group; 3.4.3 Stable Negative-Ion Formation; 3.4.4 Dissociative Thermal Electron Attachment; 3.4.5 Nonlinear Least Squares; 3.5 Milestones in the Wentworth Laboratory and Complementary Methods, 1970 to 1980; 3.6

Negative-Ion Mass Spectrometry and Morse Potential Energy Curves, 1980 to 1990; 3.7 Experimental and Theoretical Milestones, 1990 to 2000
3.8 Summary of Contributions at the University of HoustonReferences; 4. Theoretical Basis of the Experimental Tools; 4.1 Introduction; 4.2 The Kinetic Model of the ECD and NIMS; 4.3 Nondissociative Electron Capture; 4.4 Dissociative Electron Attachment; 4.5 Electron Affinities and Half-Wave Reduction Potentials; 4.6 Electron Affinities and Ionization Potentials of Aromatic Hydrocarbons; 4.7 Electron Affinities and Charge Transfer Complex Energies; 4.8 Summary; References; 5. Experimental Procedures and Data Reduction; 5.1 Introduction; 5.2 Experimental ECD and NICI Procedures
5.3 Reduction of ECD Data to Fundamental Properties5.3.1 Introduction; 5.3.2 Acetophenone and Benzaldehyde; 5.3.3 Benzanthracene, Benz[a]pyrene, and 1-Naphthaldehyde; 5.3.4 Carbon Disulfide; 5.3.5 Nitromethane; 5.3.6 Consolidation of Electron Affinities for Molecular Oxygen; 5.4 Reduction of Negative-Ion Mass Spectral Data; 5.5 Precision and Accuracy; 5.6 Evaluation of Experimental Results; 5.7 Summary; References; 6. Complementary Experimental and Theoretical Procedures; 6.1 Introduction; 6.2 Equilibrium Methods for Determining Electron Affinities; 6.3 Photon Techniques
6.4 Thermal Charge Transfer Methods6.5 Electron and Particle Beam Techniques; 6.6 Condensed Phase Measurements of Electron Affinities; 6.7 Complementary Theoretical Calculations; 6.7.1 Atomic Electron Affinities; 6.7.2 Polyatomic Molecules; 6.8 Rate Constants for Attachment, Detachment, and Recombination; 6.9 Summary; References; 7. Consolidating Experimental, Theoretical, and Empirical Data; 7.1 Introduction; 7.2 Semi-Empirical Quantum Mechanical Calculations; 7.3 Morse Potential Energy Curves; 7.3.1 Classification of Negative-Ion Morse Potentials; 7.3.2 The Negative-Ion States of H(2) 7.3.3 The Negative-Ion States of I(2)

Sommario/riassunto

Broad in scope, this book describes the general theory and practice of using the Electron Capture Detector (ECD) to study reactions of thermal electrons with molecules. It reviews electron affinities and thermodynamic and kinetic parameters of atoms, small molecules, and large organic molecules obtained by using various methods.* Summarizes other methods for studying reactions of thermal electrons with molecules* Discusses applications in analytical chemistry, physical chemistry, and biochemistry* Provides a data table of electron affinities