Record Nr. UNINA9910818938103321 Modeling of molecular properties / / edited by Peter Comba Titolo Weinheim,: Wiley-VCH, c2011 Pubbl/distr/stampa **ISBN** 3-527-63641-2 1-283-86977-2 3-527-63642-0 3-527-63640-4 Edizione [2nd ed.] Descrizione fisica 1 online resource (513 p.) CombaPeter Altri autori (Persone) Disciplina 541.220113 620.11299 Soggetti **Biochemistry** Chemistry, Inorganic Chemistry, Organic Molecules - Models Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Description based upon print version of record. Note generali Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Modeling of Molecular Properties; Contents; Preface; List of Contributors; Part One: Theory and Concepts; 1 Accurate Dispersion-Corrected Density Functionals for General Chemistry Applications: 1.1 Introduction; 1.2 Theoretical Background; 1.2.1 Double-Hybrid Density Functionals; 1.2.2 London-Dispersion-Corrected DFT; 1.3 Examples; 1.3.1 GMTKN30; 1.3.2 A Mechanistic Study with B2PLYP-D; 1.3.3 Double-Hybrids for Excited States; 1.4 Summary and Conclusions; References; 2 Free-Energy Surfaces and Chemical Reaction Mechanisms and Kinetics; 2.1 Introduction; 2.2 Elementary Reactions 2.3 Two Consecutive Steps2.4 Multiple Consecutive Steps; 2.5 Competing Reactions; 2.6 Catalysis; 2.7 Conclusions; References; 3 The Art of Choosing the Right Quantum Chemical Excited-State Method for Large Molecular Systems; 3.1 Introduction; 3.2 Existing Excited-State Methods for Medium-Sized and Large Molecules; 3.2.1 Wavefunction-Based ab initio Methods: 3.2.2 Density-Based Methods: 3.3 Analysis of Electronic Transitions: 3.4 Calculation of Static Absorption and Fluorescence Spectra; 3.5 Dark States; 3.5.1 Excited Electronic States

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Sommario/riassunto

Molecular modeling encompasses applied theoretical approaches and computational techniques to model structures and properties of molecular compounds and materials in order to predict and / or interpret their properties. The modeling covered in this book ranges from methods for small chemical to large biological molecules and materials. With its comprehensive coverage of important research fields in molecular and materials science, this is a must-have for all organic, inorganic and biochemists as well as materials scientists interested in applied theoretical and computational chemistry. The 28