1. Record Nr. UNINA9910817555003321 Autore Quinn Charles M Titolo Computational quantum chemistry: an interactive guide to basis set theory / / Charles M. Quinn San Diego, Calif., : Academic Press, c2002 Pubbl/distr/stampa **ISBN** 1-281-05273-6 9786611052737 0-08-048853-6 Edizione [1st ed.] Descrizione fisica 1 online resource (246 p.) Disciplina 541.2/8/0285 Soggetti Quantum chemistry - Data processing Gaussian basis sets (Quantum mechanics) 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 (p. [229]-230) and index. Nota di contenuto Machine generated contents note: 1 Essential atomic orbital theory --11 Atomic orbitals for the hydrogen atom -- 12 Radial distribution functions for the hydrogen atom -- 13 Radial wave functions for manyelectron atoms -- 14 Slater-type orbitals -- 15 Gaussian-type functions-the Isto-3g) minimal basis set -- 16 isto-ng) basis sets --17 Scaling factors -- 18 The (4s/2s) basis set, polarization and scaling factors for molecular -- environments -- 19 Gaussian-lobe and other Gaussian basis sets -- 2 Numerical integration -- 21 Numerical integration -- 22 Application of Simpson's rule to calculate a normalization integral -- 23 Calculations of normalization constants over the angular coordinates -- 24 Numerical integration in a cylindrical volume: diatomic and linear -- molecular geometries -- 25 Calculation of the overlap integral between Is orbitals in a Gaussian -basis -- 26 Designing Gaussian basis sets to model Slater orbitals -- 3 Orthonormality -- 31 Orthonormality in Slater orbital and basis set

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Sommario/riassunto

Computational Quantum Chemistry removes much of the mystery of modern computer programs for molecular orbital calculations by showing how to develop Excel spreadsheets to perform model calculations and investigate the properties of basis sets. Using the book together with the CD-ROM provides a unique interactive learning tool. In addition, because of the integration of theory with working examples on the CD-ROM, the reader can apply advanced features available in the spreadsheet to other applications in chemistry, physics, and a variety of disciplines that require the solution