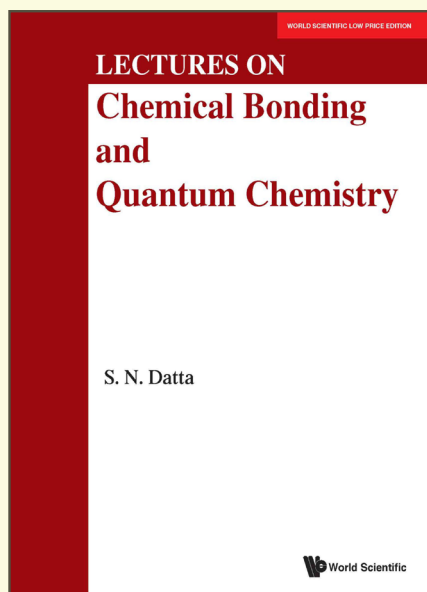


Lectures on Chemical Bonding and Quantum Chemistry



By **Sambhu Nath Datta**

(Indian Institute of Technology, Bombay, India)

ISBN	9780000991546
Extent	460pp
Binding	Paperback
Year	2024
Price	Rs. 1195

ABOUT THE BOOK

The concept of a chemical bond evolved from a variety of experimental observations. It became useful to understand, at times even predict, the molecular structure, reactivity and mechanism of chemical reactions. Every aspect of the concept of bonding received a quantitative interpretation from the advent of quantum mechanics and its application to chemistry.

In Lectures on Chemical Bonding and Quantum Chemistry the reader will find a comprehensive discourse on the basic interpretation of the chemical bond as well as current understanding in terms of a “dancing” molecule that not only travels, rotates and pulsates around an equilibrium molecular structure, but also interacts and collides with other molecules, thereby transferring linear and angular momentum characteristics and adjusting total energies. One will also find a thorough survey of quantum mechanical methodologies for calculation of molecular characteristics in specific states and their changes under spectroscopic transitions, tunneling, electron and proton transfer phenomena, and so on. Guides to more advanced levels of theory are also provided.

READERSHIP

Physical Chemistry Students, This book represents the text for two core courses of the two-year MSc Chemistry programme in almost all universities in India — ‘bonding phenomenon’ for all chemistry students of Year I and ‘quantum chemistry’ for all Second-Year students specializing in physical chemistry.

CONTENTS

- Preface
- **Chemical Bond and Molecular Geometry:**
 - Introduction
 - Fundamental Background
 - Exactly Solvable Problems
 - The Variation Method
 - Application of the Variation Method: Electronic Structure of Atoms

- Application of the Linear Variation Method: Molecular Structure
- Stationary State Perturbation Theory
- Many-Electron Function
- **Elementary Quantum Chemistry:**
 - The Matrix Representations
 - Basic Operator Formalism
 - Angular Momentum Revisited
 - Explicit Treatment of Many-Electron Atoms
 - Explicit Treatment of Molecules
 - Quantum Mechanical Tunnel Effects
 - Time-Dependent Perturbation Theory
 - Aspects of Many-Body Perturbation Theory
- **Appendices:**
 - Fundamental Physical Constants and Periodic Table
 - Useful Mathematical Relations
 - Symmetry of Molecules
- References
- Author Index
- Subject Index

For orders and enquiries, please contact us:



FEELBOOKS PVT. LTD.

www.feelbooks.in

DELHI	4381/4 Ansari Road, Daryaganj, New Delhi 110002	Tel: +91-11-47472630
	Pushendra Kumar	Mobile: +91 9015043442
		Email: orders@feelbooks.in
BENGALURU	C-22, Brigade MM, KR Road, Jayanagar 7th Block, Bengaluru 560070	Tel: +91-80-26762129
	Shekar Reddy	Mobile: +91 9945234476
		Email: bangalore@feelbooks.in
MUMBAI	Alok Dube	Mobile: +91 9833435804
		Email: adube@feelbooks.in
CHENNAI	G Srinivasan	Mobile: +91 9003047502
		Email: gsrinivasan@feelbooks.in
KOLKATA	Dhrubajyoti Bhattacharjee	Mobile: +91 9836160013
		Email: dbhattacharjee@feelbooks.in
HYDERABAD	Kundan Kumar.S	Mobile: +91 8106726072
		Email: kundan@feelbooks.in

For any queries, please email us at marketing@feelbooks.in