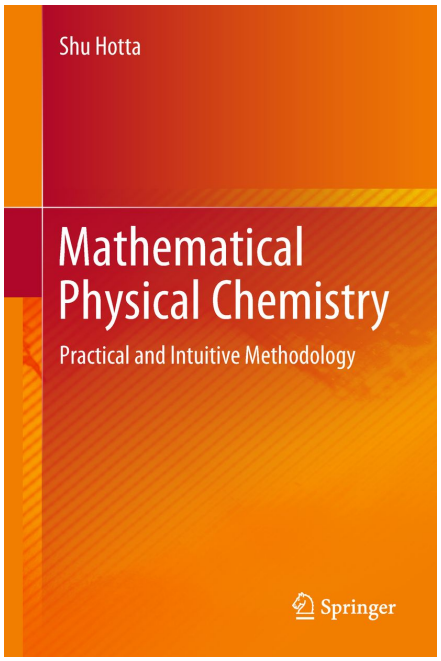

1st ed. 2018, XV, 627 p. 93 illus., 32 illus. in color.

Printed book

Hardcover

239,00 € | £209.50 | $279.00
[1]255,73 € (D) | 262,90 € (A) | CHF 263,00

Softcover

239,00 € | £199.99 | $279.00
[1]255,73 € (D) | 262,90 € (A) | CHF 282,00

eBook

202,29 € | £159.50 | $219.00
[2]202,29 € (D) | 202,29 € (A) | CHF 225,50

Available from your library or springer.com/shop

MyCopy [3]

Printed eBook for just
€ | $ 24.99
springer.com/mycopy

Shu Hotta

Mathematical Physical Chemistry

Practical and Intuitive Methodology

- Contains a judicious selection of material to help chemists understand the basic concepts of quantum mechanics and electromagnetism without abstract argument
- Shows how an operator method fits well with chemists' intuitive understanding
- Includes methodology that the author developed that will be useful to physicists

This book introduces basic concepts of mathematical physics to chemists. Many textbooks and monographs of mathematical physics may appear daunting to them. Unlike other, related books, however, this one contains a practical selection of material, particularly for graduate and undergraduate students majoring in chemistry. The book first describes quantum mechanics and electromagnetism, with the relation between the two being emphasized. Although quantum mechanics covers a broad field in modern physics, the author focuses on a hydrogen (like) atom and a harmonic oscillator with regard to the operator method. This approach helps chemists understand the basic concepts of quantum mechanics aided by their intuitive understanding without abstract argument, as chemists tend to think of natural phenomena and other factors intuitively rather than only logically. The study of light propagation, reflection, and transmission in dielectric media is of fundamental importance. This book explains these processes on the basis of Maxwell equations. The latter half of the volume deals with mathematical physics in terms of vectors and their transformation in a vector space. Finally, as an example of chemical applications, quantum chemical treatment of methane is introduced, including a basic but essential explanation of Green functions and group theory. Methodology developed by the author will also prove to be useful to physicists.