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Book Review

# Foundations of Physical Chemistry by Charles Lawrence, Alison Rodger, and Richard Compton

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*Foundations of Physical Chemistry* by Charles Lawrence, Alison Rodger, and Richard Compton. Oxford Science Publications, 96 pp., $12.95. ISBN 0-19-855904-6. Japanese translation published by Kagaku-Dojin.

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The Oxford Chemistry Primers are intended to provide students with readable accounts on essential topics in chemistry. This volume in the series covers the basics of quantum mechanics, chemical kinetics, and chemical thermodynamics. Statistical mechanics is also considered a part of physical chemistry at the advanced level, and is included only in the context of a development of rate-coefficient expressions. The book is organized by its coverage of microscopic quantum mechanics, followed by a brief introduction to the laws of thermodynamics, chemical kinetics, an extensive introduction to chemical equilibrium, and then application of the macroscopic descriptions to systems of interest.

The writing style is extremely easy to read; the writing level is accessible to students and instructors. The material is presented at a level between US general (freshman) chemistry and junior year physical chemistry courses, though the quantum mechanics section is at a higher level than the chapter on chemical equilibrium. In most textbooks, the material is presented via the mathematical derivation of equations of interest. This text approaches the content by emphasizing the underlying physical principles while presenting the many equations without extensive derivation. Many of the fundamental concepts within the text are elaborated on in the margin notes, as are frequent problems for students reviewing the material. The examples presented in the text provide frequent opportunities for readers to learn about the fundamentals in a positive manner.

The content level within the text varies slightly across the book. The quantum mechanics material is covered in greater detail than that in a typical freshman chemistry text, while the chemical thermodynamics and equilibrium chapters are at about the level of a freshman chemistry text. Chemical kinetics is covered with intermediate mathematical rigor. The quantum mechanics chapter uses the ideas of differential calculus extensively in terms of curvature and boundary value problems. Integrated forms of the rate laws are used, but the differential relations are not explored in chemical thermodynamics.

In summary, I would recommend this text for a student or instructor desiring to review their knowledge of physical chemistry, or for someone that desired an overall knowledge of the basics of physical chemistry.

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