



Essentials of Physical Chemistry

By *Don Shillady*

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Essentials of Physical Chemistry By Don Shillady

At a time when U.S. high school students are producing low scores in mathematics and science on international examinations, a thorough grounding in physical chemistry should not be considered optional for science undergraduates. Based on the author's thirty years of teaching, **Essentials of Physical Chemistry** merges coverage of calculus with chemistry and molecular physics in a friendly yet thorough manner. Reflecting the latest ACS guidelines, the book can be used as a one or two semester course, and includes special topics suitable for senior projects.

The book begins with a math and physics review to ensure all students start on the same level, and then discusses the basics of thermodynamics and kinetics with mathematics tuned to a level that stretches students' abilities. It then provides material for an optional second semester course that shows students how to apply their enhanced mathematical skills in a brief historical development of the quantum mechanics of molecules. Emphasizing spectroscopy, the text is built on a foundation of quantum chemistry and more mathematical detail and examples. It contains sample classroom-tested exams to gauge how well students know how to use relevant formulas and to display successful understanding of key concepts.

- Coupling the development of mathematical skills with chemistry concepts encourages students to learn mathematical derivations
- Mini-biographies of famous scientists make the presentation more interesting from a "people" point of view
- Stating the basic concepts of quantum chemistry in terms of analogies provides a pedagogically useful technique

Covering key topics such as the critical point of a van der Waals gas, the Michaelis–Menten equation, and the entropy of mixing, this classroom-tested text highlights applications across the range of chemistry, forensic science, pre-medical science and chemical engineering. In a presentation of fundamental topics held together by clearly established mathematical models, the book supplies a quantitative discussion of the merged science of physical chemistry.

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Editorial Review

About the Author

Don Shillady is a native of Montgomery County, Pennsylvania, U.S.A. He earned a B.S. in Chemistry from Drexel University, a Masters in Physical Chemistry from Princeton University and a Ph.D. in Physical Chemistry from the University of Virginia (1970). He has enjoyed teaching Physical Chemistry, Physical Chemistry Laboratory and Quantum Chemistry at Virginia Commonwealth University since 1970. He has edited three specialty monographs: one in Chemical Education and two on the Biological Effects of Electromagnetic Waves as well as coauthored a recent text "Electronic Molecular Structure, Connections Between Theory and Software" with Prof. Carl Trindle. He is now an emeritus Professor of Chemistry at Virginia Commonwealth University but still teaches a rapid two semester course in Physical Chemistry each summer at VCU. He has authored/coauthored 77 research publications and still maintains interest in properties of metal clusters, optical activity of large organic molecules, and Quantum Chemistry software.

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