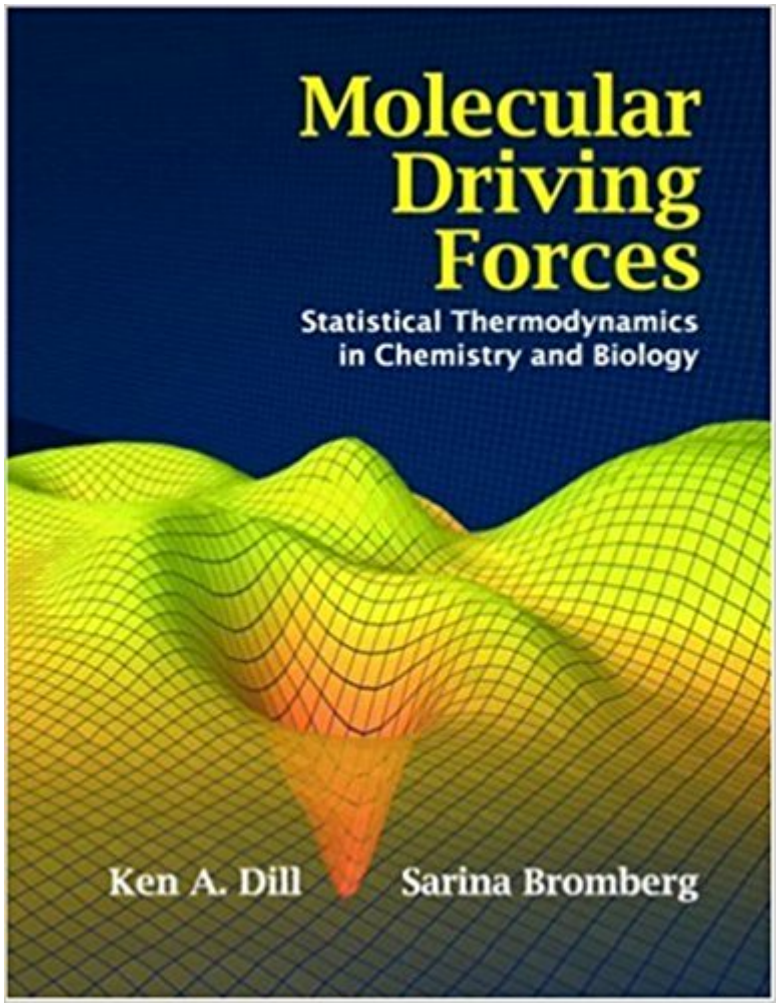
Molecular Driving Forces: Statistical Thermodynamics In Chemistry & Biology



Synopsis

Molecular Driving Forces is an introductory statistical thermodynamics text that describes the principles and forces that drive chemical and biological processes. It shows how the complex behaviors of molecules can result from a few simple physical processes, and a central theme is how simple models can give surprisingly accurate insights into the workings of the molecular world. Written in a clear and reader-friendly style, the book gives an excellent introduction to the subject for novices. It should be useful to those who want to develop their understanding of this important field, seeing how physical principles can be applied to the study of modern problems in the chemical, biological, and materials sciences.

Book Information

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Customer Reviews

A real intellectual tour de force, and a pleasure to teach from. -- David L. Beveridge, Wesleyan Universityl found it very refreshing. Plausible examples are introduced at a very early stage. -- Richard Jones, University of Sheffield, UKThe examples send the reader right out of textbook land and into interesting and current problems. -- John Schellman, University of OregonThis is the most clearly written, insightful Physical Chemistry text available. -- Terrence G. Oas, Duke University

KEN A. DILL is Professor of Pharmaceutical Chemistry and Biophysics at the University of California, San Francisco. He received his undergraduate training at MIT, his PhD from the University of California, San Diego, and did postdoctoral work at Stanford. A leading researcher in biopolymer statistical mechanics and protein folding, he has been the President of the Biophysical

Society and received the Hans Neurath Award from the Protein Society in 1998. SARINA BROMBERG received her BFA at the Cooper Union for the Advancement of Science and Art, her PhD in molecular biophysics from Wesleyan University, and her postdoctoral training at the University of California, San Francisco. She writes, edits and illustrates scientific textbooks.

When I picked up this book, I was expecting a book on stat mech. This book is not so much a treatment of stat mech. as a very well put together course in physical chemistry. It covers all of the basics from thermodynamics to solutions of electrolytes to polymer chemistry. It does all of this in a very approachable manner that gives the reader a thorough understanding without too much gory detail. Also, the terms in the equations are generally well explained which is a nice touch for an introductory text such as this given that too many books either simply let the equations stand for themselves or define a variable once then reference it hundreds of pages later without reintroducing it. This is an excellent book for self study and leaves a good foundation for readers to move on to more advanced stat mech. books such as those by Pathria,Ã Â Statistical Mechanics, or Hill,Ã Â An Introduction to Statistical Thermodynamics (Dover Books on Physics).

This book is a triumph of technical writing. Ken Dill possesses an extraordinary ability to distill complex technical concepts down to the cogent bits necessary to understand the physics of the situation. The maxim, "make it as simple as possible, but not simpler" definitely applies here. The only major challenge with this book is that a reader may come away with a notion of inflated comprehension. This is not a fault...just a byproduct of the big contrast between the clarity of the Dill (and Bromberg) text and the other, technically obfuscated, textbooks and articles in the field.Easily the best (introductory) textbook on statistical physics that I have encountered, and the only one that I can heartily recommend to a student or non-specialist.

I used this excellent book by Ken Dill for my stat mech class along with Chandler. Dill eases the student through the sometimes painful world of stat mech. The many examples and pictures help the understanding of material. Also, derivations are shown in baby steps so that math and physics deprived students like me can handle the material. Chandler is more eloquent but for a student unfamiliar with the material, it’s way above my head at times. The two books are very complementary.

Dill’s book is the perfect introduction to statistical mechanics, especially for those in the biological

sciences. I'm a graduate student and read his book before McQuarrie's - which worked out very well. He uses lattice models a lot so that more difficult topics become intuitive. For some, the book may be a little basic. But for those who don't have a solid background in probability or physical chemistry, this book is perfect. Even for the more advanced student, this book is truly a fun read and can inspire creativity.

The most important part of a book should be the worked examples.But there is not a single solution for theend of the chapter problems,not even a simple answer.

I'm a grad student in chemistry, and I adore this text. Assuming you have a basic calculus and thermo background, this is all one needs as a reference to accessing more advanced / specialized texts. Even at that, the first few chapters provide a useful refresher on vector calculus and chemical potentials, etc, though I wouldn't rely on this text as your soul source to learn about those more fundamental topics.

Great book. I finally understand entropy and thermodynamics! This is very helpful in my work with the binding and stability of proteins.I have a BA in biochemistry.

The book gives a overview for statistical mechanics in biophysics. It will be an application oriented book for physicists. The way the book is written might be bit daunting for people completely new to physical sciences. It is an important book for biophysicts and can be used to brush up concepts for people who are already into the field

(Oxford Chemistry Primers) Bacteriophages: Methods and Protocols, Volume 2: Molecular and Applied Aspects (Methods in Molecular Biology) An Introduction to Statistical Thermodynamics (Dover Books on Physics) Thermal Physics: An Introduction to Thermodynamics, Statistical Mechanics, and Kinetic Theory (Oxford Science Publications) Thermodynamics and Statistical Mechanics of Macromolecular Systems An Introduction to Applied Statistical Thermodynamics Molecular Visions (Organic, Inorganic, Organometallic) Molecular Model Kit #1 by Darling Models to accompany Organic Chemistry Organic Chemistry Molecular Model Set: Molecular Model Set Study Guide: Ace Organic Chemistry I - The EASY Guide to Ace Organic Chemistry I: (Organic Chemistry Study Guide, Organic Chemistry Review, Concepts, Reaction Mechanisms and Summaries) Ace General Chemistry I and II (The EASY Guide to Ace General Chemistry I and II): General Chemistry Study Guide, General Chemistry Review Analytics: Business Intelligence, Algorithms and Statistical Analysis (Predictive Analytics, Data Visualization, Data Analytics, Business Analytics, Decision Analysis, Big Data, Statistical Analysis)