The Kinetic Theory Of Matter Classzone

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A Kinetic Theory of Gases and Liquids
Kinetic Theory of Gases
Matter, Energy, Force, and Work
Introduction to Thermodynamics and Kinetic Theory of Matter
An Introduction to the Kinetic Theory of Gases
The Stability of Matter: From Atoms to Stars

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Contemporary Kinetic Theory of Matter Elsevier
A pioneering text in its field, this comprehensive study is one of the most valuable texts and references available. The author explores the classical kinetic theory in the first four chapters, with discussions of the mechanical picture of a perfect gas, the mean free path, and the distribution of molecular velocities. Tbhe fifth chapter deals with the more accurate equations of state, or Van der Waals' equation, and later chapters examine viscosity, heat conduction, surface phenomena, and Browninan movements. The text surveys the application of quantum theory to the problem of specific heats and the contributions of kinetic theory to knowledge of electrical and magnetic properties of molecules, concluding with applications of the kinetic theory to the conduction of electricity in gases. 1934 edition.
Quantum Kinetic Theory and Applications Springer
The inner magnetosphere plasma is a very unique composition of different plasma particles and waves. It covers a huge energy plasma range with spatial and time variations of many orders of magnitude. In such a situation, the kinetic approach is the key element, and the starting point of the theoretical description of this plasma phenomena which requires a dedicated book to this particular area of research.
Molecules and the Molecular Theory of Matter Springer Science & Business Media
Back Cover Text: This book addresses the study of the gaseous state of granular matter in the conditions of rapid flow caused by a violent and sustained excitation. In this regime, grains only touch each other during collisions and hence, kinetic theory is a very useful tool to study granular flows. The main difference with respect to ordinary or molecular fluids is that grains are macroscopic and so, their collisions are inelastic. Given the interest in the effects of collisional dissipation on granular media under rapid flow conditions, the emphasis of this book is on an idealized model (smooth inelastic hard spheres) that isolates this effect from other important properties of granular systems. In this simple model, the inelasticity of collisions is only accounted for by a (positive) constant coefficient of normal restitution. The author of this monograph uses a kinetic theory description (which

can be considered as a mesoscopic description between statistical mechanics and hydrodynamics) to study granular flows from a microscopic point of view. In particular, the inelastic version of the Boltzmann and Enskog kinetic equations is the starting point of the analysis. Conventional methods such as Chapman-Enskog expansion, Grad's moment method and/or kinetic models are generalized to dissipative systems to get the forms of the transport coefficients and hydrodynamics. The knowledge of granular hydrodynamics opens up the possibility of understanding interesting problems such as the spontaneous formation of density clusters and velocity vortices in freely cooling flows and/or the lack of energy equipartition in granular mixtures. Some of the topics covered in this monograph include: Navier-Stokes transport coefficients for granular gases at moderate densities Long-wavelength instability in freely cooling flows Non-Newtonian transport properties in granular shear flows Energy nonequipartition in freely cooling granular mixtures Diffusion in strongly sheared granular mixtures Exact solutions to the Boltzmann equation for inelastic Maxwell models

The Kinetic Theory of Gases Wiley-VCH

Excerpt from A Kinetic Theory of Gases and Liquids The object of writing this book is to formulate a Kinetic Theory of certain properties of matter, which shall apply equally well to matter in any state. The desirability of such a development need not be emphasized. The difficulty hitherto experienced in applying the results obtained in the case of the Kinetic Theory of Gases in the well-known form to liquids and intermediary states of matter has been primarily due to the difficulty of properly interpreting molecular interaction. In the case of gases this difficulty is in most part overcome by the introduction of the assumption that a molecule consists of a perfectly elastic sphere not surrounded by any field of force. But since such a state of affairs does not exist, the results obtained in the case of gases hold only in a general way, and the numerical constants involved are therefore of an indefinite nature, while in the case of dense gases and liquids this procedure does not lead to anything that is of use in explaining the facts. Instead of an atom, or molecule, consisting of a perfectly elastic sphere, it is more likely that each may be regarded simply as a center of forces of attraction and Repulsion. If the exact nature of the field of force surrounding atoms and molecules were known, it would be a definite mathematical problem to determine the resulting properties of matter. But our knowledge in this connection is at present not sufficiently extensive to permit a development of the subject along these lines. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Gases, Liquids and Solids CRC Press

This monograph and text was designed for first-year students of physical chemistry who require further details of kinetic theory. The treatment focuses chiefly on the molecular basis of important thermodynamic properties of gases, including pressure, temperature, and thermal energy. Includes numerous exercises, many partially worked out, and end-of-chapter problems. 1966 edition.

Thermal Properties of Matter: Kinetic theory of gases MIT Press

This is now the third edition of a well established and highly successful undergraduate text. The content of the second edition has been reworked and added to where necessary, and completely new material has also been included. There are new sections on amorphous solids and liquid crystals, and completely new chapters on colloids and polymers. Using unsophisticated mathematics and simple models, Professor Tabor leads the reader skilfully and systematically from the basic physics of interatomic and intermolecular forces, temperature, heat and thermodynamics, to a coherent understanding of the bulk properties of gases, liquids and solids. The introductory material on intermolecular forces and on heat and thermodynamics is followed by several chapters dealing with the properties of ideal and real gases, both at an elementary and at a more sophisticated level. The mechanical, thermal and electrical properties of solids are considered next, before an examination of the liquid state. The author continues with chapters on colloids and polymers, and ends with a discussion of the dielectric and magnetic properties of matter in terms of simple atomic models. The abiding theme is that all these macroscopic material properties can be understood as resulting from the competition between thermal energy and intermolecular or interatomic forces. This is a lucid textbook which will continue to provide students of physics and chemistry with a comprehensive and integrated view of the properties of matter in all its many fascinating forms.

The Molecular Theory of Gases and Liquids Taylor & Francis

The world is governed by motions. The term kinetics partially originated from the Greek word "kinisis," which means motion. How important is motion in our life is easily understood. But, how the kinetic theories have been developed during years? Which are the new kinetic theories and updates in recent years? This question and many others can be answered with this book. Some important areas discussed in this book are the kinetic theory of gases, kinetic theory of liquids and vapors, thermodynamic aspects, transportation phenomena, adsorption-kinetic theories, linear and nonlinear kinetic equations, quantum kinetic theory, kinetic theory of nucleation, plasma kinetic theory, and relativistic kinetic theory.

Kinetic Theory of Matter and Mechanics of Solids Courier Corporation

Examines basic concepts and the First Law, Second Law, equilibria, Nernst's Heat Theorem, and the kinetic theory of gases. Includes an index and a wealth of figures. An important resource for students and physicists, it can be read independently by those who wish to focus on individual topics. 1973 edition.

Applications of the Kinetic Theory to Gases, Vapors, Pure Liquids, and the Theory of Solutions Courier Corporation

Imparts the similarities and differences between ratified and condensed matter, classical and quantum systems as well as real and ideal gases. Presents the quasi-thermodynamic theory of gas-liquid interface and its application for density profile calculation within the van der Waals theory of surface tension. Uses inductive logic to lead readers from observation and facts to personal interpretation and from specific conclusions to general ones.

Quantum Kinetic Theory Cambridge University Press

This lecture-style monograph is addressed to several categories of readers. First, it will be useful for graduate students studying theory. Second, the topics covered should be interesting for postgraduate students of various specializations. Third, the researchers who want to understand the background of modern theoretical issues in more detail can find a number of useful results here. The phenomena covered involve kinetics of electron, phonon, and photon systems in solids. The dynamical properties

and interactions of electrons, phonons, and photons are briefly described in Chapter 1. Further, in Chapters 2-8, the authors present the main theoretical methods: linear response theory, various kinetic equations for the quasiparticles under consideration, and diagram technique. The presentation of the key approaches is always accompanied by solutions of concrete problems to illustrate ways to apply the theory. The remaining chapters are devoted to various manifestations of quantum transport in solids. The choice of particular topics is determined by their scientific importance and methodological value. The 267 supplementary problems presented in the ends of chapters are offered to guide the reader in self-study. Focusing attention on the methodological aspects and discussing a great diversity of kinetic phenomena, in keeping with the guiding principle "a method is more important than a result", the authors minimize both detailed discussion of physical mechanisms of the phenomena considered and comparison of theoretical results to experimental data.

Thermodynamics and the Kinetic Theory of Gases John Wiley & Sons

Chemistry 2e is designed to meet the scope and sequence requirements of the two-semester general chemistry course. The textbook provides an important opportunity for students to learn the core concepts of chemistry and understand how those concepts apply to their lives and the world around them. The book also includes a number of innovative features, including interactive exercises and real-world applications, designed to enhance student learning. The second edition has been revised to incorporate clearer, more current, and more dynamic explanations, while maintaining the same organization as the first edition. Substantial improvements have been made in the figures, illustrations, and example exercises that support the text narrative. Changes made in Chemistry 2e are described in the preface to help instructors transition to the second edition.

Lectures on Gas Theory Oxford Science Publications

Many laboratory and astrophysical plasmas show deviations from local ther modynamic equilibrium (LTE). This monograph develops non-LTE plasma spectroscopy as a kinetic theory of particles and photons, considering the radiation field as a photon gas whose distribution function (the radiation in tensity) obeys a kinetic equation (the radiative transfer equation), just as the distribution functions of particles obey kinetic equations. Such a unified ap proach provides clear insight into the physics of non-LTE plasmas. Chapter 1 treats the principle of detailed balance, of central importance for understanding the non-LTE effects in plasmas. Chapters 2, 3 deal with kinetic equations of particles and photons, respectively, followed by a chapter on the fluid description of gases with radiative interactions. Chapter 5 is devoted to the H theorem, and closes the more general first part of the book. The last two chapters deal with more specific topics. After briefly discuss ing optically thin plasmas, Chap. 6 treats non-LTE line transfer by two-level atoms, the line profile coefficients of three-level atoms, and non-Maxwellian electron distribution functions. Chapter 7 discusses topics where momentum exchange between matter and radiation is crucial: the approach to thermal equilibrium through interaction with blackbody radiation, radiative forces, and Compton scattering. A number of appendices have been added to make the book self-contained and to treat more special questions. In particular, Appendix B contains an in troductory discussion of atomic line profile coefficients.

Atoms and Elements Courier Corporation

The study of matter is the study of all material things, as well as their ability to transform from one state to another. All matter assumes one of several basic statessolid, liquid, gas, and plasma being the most common. Under varying conditions, each state can be altered to form new substances or adopt new characteristics. This insightful book covers the various structures and elements of different types of matter, while examining the physical and chemical properties that allow for permutation and change.

Applications of the Kinetic Theory Springer Science & Business Media

This book offers a comprehensive and cohesive overview of transport processes associated with all kinds of charged particles, including electrons, ions, positrons, and muons, in both gases and condensed matter. The emphasis is on fundamental physics, linking experiment, theory and applications. In particular, the authors discuss: The kinetic theory of gases, from the traditional Boltzmann equation to modern generalizations A complementary approach: Maxwell’s equations of change and fluid modeling Calculation of ion-atom scattering cross sections Extension to soft condensed matter, amorphous materials Applications: drift tube experiments, including the Franck-Hertz experiment, modeling plasma processing devices, muon catalysed fusion, positron emission tomography, gaseous radiation detectors Straightforward, physically-based arguments are used wherever possible to complement mathematical rigor. Robert Robson has held professorial positions in Japan, the USA and Australia, and was an Alexander von Humboldt Fellow at several universities in Germany. He is a Fellow of the American Physical Society. Ronald White is Professor of Physics and Head of Physical Sciences at James Cook University, Australia. Malte Hildebrandt is Head of the Detector Group in the Laboratory of Particle Physics at the Paul Scherrer Institut, Switzerland.

The Britannica Guide to Matter The Rosen Publishing Group, Inc

This book can be described as a student's edition of the author's Dynamical Theory of Gases. It is written, however, with the needs of the student of physics and physical chemistry in mind, and those parts of which the interest was mainly mathematical have been discarded. This does not mean that the book contains no serious mathematical discussion; the discussion in particular of the distribution law is quite detailed; but in the main the mathematics is concerned with the discussion of particular phenomena rather than with the discussion of fundamentals.

Kinetic Theory of Matter and Mechanics of Solids Cambridge University Press

"The aim of this book is to give a physical treatment of the kinetic theory of gases and magnetoplasmas, covering the standard material in as simple a way as possible, using mean-free-path arguments when possible and identifying problem areas where received theory has either failed or has fallen short of expectations. Examples of problem areas are provided by strong shock waves, ultrasonic waves (high Knudsen numbers), and transport across strong magnetic fields."--Back cover.

Granular Gaseous Flows Springer

By focusing on the conceptual issues faced by nineteenth century physicists, this book clarifies the status of field theory, the ether, and thermodynamics in the work of the period. A remarkably synthetic account of a difficult and fragmentary period in scientific development.

Kinetic Theory of the Inner Magnetospheric Plasma Springer Science & Business Media

A masterpiece of theoretical physics, this classic contains a comprehensive exposition of the kinetic theory of gases. It combines rigorous mathematic analysis with a pragmatic treatment of physical and chemical applications.

A Journey Around the Different Scales Involved in the Description of Matter and Complex Systems Springer

This SpringerBrief covers the main scales of description of

matter, starting at its finest level, the quantum scale, moving through ab-initio, molecular dynamics, coarse grained approaches, to finish at the scale of kinetic theory models that allows a nice compromise between the rich but expensive microscopic descriptions and the computationally cheap but sometimes too coarse macroscopic descriptions. The book addresses undergraduate and graduate students, as well as beginners in multi-scale modeling of materials.

Kinetic Theory John Wiley & Sons

A thorough examination of kinetic theory and its successes in understanding and describing irreversible phenomena in physical systems.