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13   ISBN   9787040272635

10   ISBN   7040272636

            2009-7

                                              (2009-07   )

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On the base of Physic Fourth Edition .the revision of this book is made consulting The Basic Requirement of Teaching University Physics Course for Non-physical Major in University of Science and Engineering Discussion Draft and constituted lastly by sub-committee of physics essential lecture teaching guidance for non-physics specialty Education Department .What in the book contains all of kernels required in the basic requirement moreover a certain amount of extension content is presented as well as for different majors. In the revision this book keeps specialties such as logical system well-situated profundity and extension proper capacity wide flexibility coming from the original vision of the book. Meanwhile it adds more contents in following aspects modern physics the annotation with modern viewpoints for classic physics .and the effects to science and technology from the achievements of modern physics. This book has two volumes. In Volume I it contains mechanics and electromagnetic. And in Volume .it contains Oscillationand undulation optics theory of molecular dynamics and basic of thermodynamics theory of relativity. quantum physics. There are books The Applications of Physical Principle in Engineering and Technology Third Edition The Analysis and Solution for Exercises in Physics Fifth Edition Guidance for Learning Physics Fifth Edition and the multimedia The Electronic Teaching P1∞for Physics Fifth Edition to form a complete set with this book.

This book can be the teaching material of the his her education for non-physical major in university of sciences and engineering. It can also be selected as texts by the relevant fields of social sciences and natural seiences and read by social readers at 1arge.

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From the Clausius expression of the second law of thermodynamics we already know that a high temperatureobject would automatically transport heat to a low temperature object,whereas a low temperature object would notautomatically transport heat to a high temperature object. If we treat the heat flow from a high temperature objectto a low temperature object as the forward process and the heat flow from a low temperature object to a hightemperature object as the reverse process, obviously, the reverse process can not go on automatically. That is tosay,if we want to transfer heat from a low temperature object to a high temperature object the exterior must neces-sarily do work on the system consisting of the high and low temperature objects. As a result of the work done bythe exterior,the environment of the exterior would have to change (such as energy would have to be consumedand so on). Therefore, under the circumstances that the exterior environment does not change, the processes ofheat transport is irreversible. The analysis above on the irreversibility of the processes is based on heat transport between high and lowtemperature objects. In fact the conversion between heat and work is also of irreversibility. For example, throughfriction, work can be completely converted into heat, but heat can not be completely converted into work withoutcausing other changes. If we take the conversion of work into heat as the forward process and the conversion ofheat into work as the reverse process, then under the circumstances of no other changes the conversion betweenwork and heat is also irreversible. In nature,there are numerous discussions of the reversibility and irreversibility of thermodynamic processes,we must understand them right. The definition of the reversible and irreversible processes is as follows: in aprocess of the change of state of a system, if the reverse process can repeat every state of the forwardprocess without causing other changes, such a process is called the reversible process. Conversely, underthe condition of not causing other changes, the reverse process can not repeat every state of the forwardprocess,or the repetition must cause other changes, such a process is called the irreversible process. What is the condition of realizing a reversible process?Only if the process of the change of the state of thesystem is an infinitely slowly quasi-static process and in the process there is no effect of energy dissipation. Thenthe process that the system is going through is a reversible process,otherwise it is an irreversible process. We givean example as follows.

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