

<<Barron's SAT II 物理>>

图书基本信息

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内容概要

this 10th edition of barron's sat subject physics contains corrections to the 9th edition and some new material. unlike other review books, which just present practice test questions, this book provides you with full content review, tips for improving problem-solving skills, test-taking strategies, special sidebars that highlight important concepts, and self-assessment rubrics to improve your test score.

the book begins with an introduction to the sat subject test in physics. remember that any review book can give you only an approximation of the full content of an sat subject exam. since the material contained on an actual exam is owned by copyright, all tests included in this book (as well as percentages of content distribution) are necessarily simulated to reflect the level and types of questions you may encounter on the actual exam.

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作者简介

作者：（美国）格维尔茨（Herman Gewirtz）（美国）沃尔夫（Jonathan S.Wolf）

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章节摘录

版权页：插图：In the nineteenth century, chemical experiments to explain these effects showed the presence of molecules called ions in solution. These ions possessed similar affinities for certain objects, such as carbon or metals, placed in the solution. These objects are called electrades. The experiments confirmed the existence of two types of ions, positive and negative. The effects they produce are similar to the two types of effects produced when ebonite and glass are rubbed. Even though both substances attract small objects, these objects become charged oppositely when rubbed, as indicated by the behavior of the pith ball. Further, chemical experiments coupled with an atomic theory demonstrated that in solids it is the negative charges that are transferred. Additional experiments by Michael Faraday in England during the first half of the nineteenth century suggested the existence of a single, fundamental carrier of electric charge, which was later named the electron. The corresponding carrier of positive charge was termed the proton. When ebonite is rubbed with cloth, only the part of the rod in contact with the cloth becomes charged. The charge remains localized for some time (hence the name static). For this reason, among others, rubber, along with plastic and glass, is called an insulator. A metal rod held in your hand cannot be charged statically for two reasons. First, metals are conductors, that is, they allow electric charges to flow through them. Second, your body is a conductor, and any charges placed in the metal rod are conducted out through you (and into the earth). This effect is called grounding. The silver-coated pith balls mentioned in the preceding section can become statically charged because they are suspended by thread, which is an insulator. They can be used to detect the presence and sign of an electric charge, but they are not very helpful in obtaining a qualitative measurement of the magnitude of charge they possess. An instrument that is often used for qualitative measurement is the electroscope. One form of electroscope consists of two "leaves" made of gold foil (Figure 15.2a). The leaves are vertical when the electroscope is uncharged. As a negatively charged rod is brought near, the leaves diverge. If you recall the hypothesis that only negative charges move in solids, you can understand that the electrons in the knob of the electroscope are repelled down to the leaves through the conducting stem. The knob becomes positively charged, as can be verified with a charged pith ball, as long as the rod is near but not touching (Figure 15.2b). Upon contact, electrons are directly transferred to the knob, stem, and leaves. The whole electroscope then becomes negatively charged (Figure 15.2c). The extent to which the leaves are spread apart is an indication of how much charge is present (but only qualitatively). If you touch the electroscope, you will ground it and the leaves will collapse together.

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