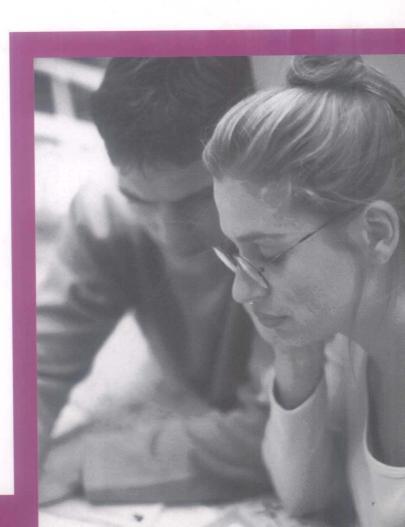


Subject Test in Chemistry

Joseph A. Mascetta

The Eighth

Four full-length model tests
Plus a diagnostic test
All questions answered and explained
Extensive subject review





Subject Test in Chemistry

Joseph A. Mascetta

The Eighth

Four full-length model tests
Plus a diagnostic test
All questions answered and explained
Extensive subject review

图书在版编目(CIP)数据

BARRON'S SAT 化学 = BARRON'S SAT Subject Test in Chemistry / (美) 马谢塔 (Mascetta, J. A.) 编. 一北京: 世界图书出版公司北京公司, 2007.3

ISBN 978-7-5062-7311-4

[.S··· []. 马··· []. 化学一高等学校一人学考试一美国一自学参考资料 [V. 06

中国版本图书馆 CIP 数据核字 (2007) 第 031227 号

SAT SUBJECT TEST IN CHEMISTRY (8th EDITION) BY JOSEPH A. MASCETTA

Copyright: ©

This edition arranged with BARRON'S EDUCATIONAL SERIES, INC.

through BIG APPLE TUTTLE-MORI AGENCY, LABUAN, MALAYSIA.

Simplified Chinese edition copyright:

2007 BEIJING WORLD PUBLISHING CORPORATION

All rights reserved.

MAINLAND CHINA EXCLUDING THE HONG KONG S. A. R. AND THE MACAU S. A. R. 仅限于在中华人民共和国大陆境内(不包括中国香港,澳门特别行政区)销售发行。

BARRON'S SAT Subject Test in Chemistry BARRON'S SAT 化学

作 者: Joseph A. Mascetta

责任编辑:代倩梅

出 版:世界图书出版公司北京公司

发 行: 世界图书出版公司北京公司

(地址:北京朝内大街 137 号 邮编: 100010 电话: 64077922)

销 售:各地新华书店和外文书店

印 刷:三河国英印务有限公司

开 本: 880×1230 1/16

印 张: 26.25

字 数:500 千

版 次: 2007年3月第1版 2007年3月第1次印刷

版权登记:图字 01-2007-1457

ISBN 978-7-5062-7311-4/G • 271

定价: 49.00 元

Introduction 人门

GENERAL INFORMATION ABOUT THE TEST

关于考试的基本信息

The College Board, which is a national nonprofit membership organization, sponsors the Admissions Testing Program (ATP). Educational Testing Service (ETS) develops and administers the tests for the College Board and also prepares a booklet about the testing program, of which the SAT Subject Tests are a part. Copies of this booklet, which describes each of the SAT Subject Tests and gives sample questions, are automatically sent at the beginning of each academic year to secondary schools for free distribution to students who plan to register for the SAT Subject Tests. The name of this publication is *Taking the SAT Subject Tests*, and requests from schools or individuals about how to obtain free copies should be addressed to College Board SAT Program, P.O. Box 6200, Princeton, NJ 08541-6200. The phone number (Monday–Friday) is (609) 771-7600, 8:30 A.M. to 9:30 P.M. Eastern Time; or you can order online at www.collegeboard.com.

All of the SAT Subject Tests are contained in the same test booklet. Each takes 1 hour of testing time, and you may choose any one, two, or three tests to take at one sitting. They all consist of multiple-choice questions.

Many colleges require or recommend one or more Subject Tests for admission or placement. The scores are used in conjunction with your high school record, results on the SAT, teacher recommendations, and other background information to provide a reliable measure of your academic achievements and a good predication of your future performance.

In addition to obtaining a standardized assessment of your achievement from your scores, some colleges use the test results for placement into their particular programs in the freshman year. At others, advisers use the results to guide freshmen in the selection of courses.

Is the SAT Subject Test in Chemistry Required? 参加SAT化学考试是必需的吗?

The best information on whether SAT Subject Tests are required and, if so, which ones is found in the individual college catalogs or a directory of colleges. Some colleges specify which tests you must take, while others allow you to choose. Obviously, if you have a choice and you have done well in chemistry, you should pick the SAT Subject Test in Chemistry as one of your tests. The College Board publishes *The College Handbook*, which is a good source of information about colleges' requirements with regard to taking SAT Subject Tests. A copy of this book should be in your school library. You can also order it by using your registration form or by visiting the College Board's online store at http://www.collegeboard.com.

When Should You Take the Test? 什么时间应该参加考试?

You will undoubtedly do best if you take the test after completing the high school chemistry course or courses that you plan to take. At this time, the material will be fresh in your mind. Forgetting begins very quickly after you are past a topic or have finished the course. You should plan a review program for at least the last 6 weeks before the test date. (A plan is provided later in this book for such a review.) Careful review definitely helps—cramming just will not do if you want to get the best score of which you are capable!

Colleges that use SAT Subject Test results as part of the admissions process usually require that you take the test no later than December or January of your senior year. For early-decision programs, the test time is June of your junior year. Since chemistry is often a junior year course, June of that year is the optimum time to take the test.

When Is the Test Offered? 什么时间举办考试?

The chemistry test is available every time the SAT Subject Tests are given, that is, in October, November, December, January, May, and June. Be sure that the testing site for which you plan to register offers the SAT Subject Tests on each of these six times. Remember that you may choose to take one or two additional tests besides chemistry on any one test day. You do have to specify in advance which tests you plan to take on the test date you select; however, except for the Language Test with Listening, you may change your mind on the day of the test.

How Do You Register? 如何登记?

The Registration Bulletin for the SAT Reasoning and SAT Subject Tests contains all the information you need to register and to have your scores sent to the college(s) of your choice. Copies of this publication should be available in every high school guidance office. If you have a problem getting one, write to College Board Admissions Testing Program (see the address in "General Information About the Test," on page x) or go online to www. collegeboard.com.

Projected registration and test dates are listed in the calendar below.

How Should You Prepare for the Test? 如何准备SAT考试?

Barron's SAT Subject Test in Chemistry will be especially helpful. The more you know about the test, the more likely you are to get the best score possible for you. This book provides you with a diagnostic test, scoring information, four practice tests and the equivalent of one more test incorporated with the chapter review tests that allow you to become familiar with the question types and the wording of directions, and to gain a feel for the degree of emphasis on particular topics and the ways in which information may be tested. Each of these aspects should be consciously pursued as you use this book.

PROJECTED CALENDAR FOR THE SAT SUBJECT TEST IN CHEMISTRY

WHEN THE TEST IS GIVEN ON:	REGISTRATION DEADLINE IS:	LATE REGISTRATION IS:
October 7, 2006	September 6, 2006	September 13, 2006
November 4, 2006	September 29, 2006	October 11, 2006
December 2, 2006	October 27, 2006	November 8, 2006
January 28, 2007	December 21, 2006	January 3, 2007
May 5, 2007	March 28, 2007	April 4, 2007
June 2, 2007	April 25, 2007	May 9, 2007

What Topics Appear on the Test, and to What Extent?

考试会考什么内容? 难度如何?

The following charts show the content of the test and the levels of thinking skills tested:

	TOPICS	PERCENT OF TEST (APPROX.)	NUMBER OF QUESTIONS (APPROX.)
Structure	 Atomic theory and structure; periodic relationships Nuclear reactions Chemical bonding and molecular structure 	25	. 21
States of Matter	 Kinetic molecular theory of gases and the gas laws Liquids, solids, and phase changes Solutions; concentration units, solubility, conductivity, and colligative properties 	15	13
Reaction Types	 Acids and bases Oxidation-reduction; electrochemical cells Precipitation 	14	12
Stoichiometry	Mole concept, Avogadro's number, empirical and molecular formulas, stoichiometric calculations, percentage composition, limiting reagents	12	10
Equilibrium and Reaction Rates	Equilibrium; mass action expressions, ionic equilibria, Le Châtelier's Principle; factors affecting rates of reaction	7	6
Thermodynamics	Energy changes in chemical reactions; physical processes, Hess's Law, randomness	6	5
Descriptive Chemistry	Physical and chemical properties of elements and their more familiar compounds, chemical reactivity and products of chemical reactions, simple examples from organic and environmental chemistry	13	11
Laboratory	Equipment, measurement, procedures, observations, safety, calculations, interpretation of results	7	6

Note: Each test contains approximately five questions on equation balancing and/or predicting products of chemical reactions. These are distributed among the various content categories.

THINKING SKILLS TESTED	PERCENT OF TEST (APPROX.)
Recalling fundamental concepts, specific pieces of information, and basic terminology (low-level skill)	20
Showing a comprehension of the basics and the ability to apply this information in a rather straightforward manner to questions, situations, and the solution of qualitative or quantitative problem-oriented questions (medium-level skill)	45
Using-the ability to <i>analyze</i> information and/or situations and to <i>synthesize</i> the knowledge learned to <i>evaluate</i> how and what ideas or relationships should be used to draw conclusions or to solve problems (high-level skill)	35

The first chart gives you a general overview of the content of the test. Your knowledge of the topics and your skills in recalling, applying, and synthesizing this knowledge are evaluated through 85 multiple-choice questions. This material is that generally covered in an introductory course in chemistry at a level suitable for college preparation. While every test covers the topics listed, different aspects of each topic are stressed from year to year. Add to this the differences that exist in high school courses with respect to the percentage of time devoted to each major topic and to the specific subtopics covered, and you may find that there are questions on topics with which you have little or no familiarity.

Each of the sample tests in this book is constructed to match closely the distribution of topics shown in the preceding chart so that you will gain a feel for the makeup of the actual test. After each test, a chart will show you which questions relate to each topic. This will be very helpful to you in planning your review because you can identify the areas on which you need to concentrate in your studies. Another chart enables you to see which chapters correspond to the various topic areas.

What General Information Should You Have About the Test? 关于考试需要具备哪些常识?

A periodic chart is provided in the SAT Subject Test in Chemistry as a resource and as the source of atomic numbers and atomic masses of elements that are needed in solving problems. You will not be allowed to use an electronic calculator during the test. Numerical calculations are limited to simple arithmetic. You should be familiar with the concepts of ratios and direct and inverse proportions, scientific notation, and exponential functions. In this test, the metric system of units is used.

The test is composed of three types of questions. The directions and formats are identical to those used in all of the sample tests in this book. The questions are all of the multiple-choice type, in which you must choose from the five choices given. More information about question types is provided in the following section.

What Types of Questions Appear on the Test? 考试会考哪些类型的问题?

There are three general types of questions on the SAT Subject Test in Chemistry—matching questions, true/false and relationship questions, and general multiple-choice questions. This section will discuss each type and give specific examples of how to answer these questions. You should learn the directions for each type so that you will be familiar with them on the test day. The directions in this section are identical to those on the test.

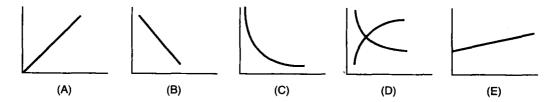
Type 1. Matching questions in Part A. 配对问题 In each of these questions, you are given five lettered choices that you will use to answer all the questions in that set. The choices may be in the form of statements, pictures, graphs, experimental findings, equations, or specific situations. Answering a question may be as simple as recalling information or as difficult as analyzing the information given to establish what you need to do qualitatively or quantitatively to synthesize your answer. The directions for this type of question specifically state that a choice may be used once, more than once, or not at all in each set.

PART A

<u>Directions</u>: Every set of the given choices below refers to the numbered statements or formulas immediately following it. Choose the one lettered choice that best fits each statement or formula and then fill in the corresponding oval on the answer sheet. Each choice may be used once, more than once, or not at all in each set.

EXAMPLE

Questions 1-3 refer to the following graphs:



- 1. The graph that best shows the relationship of volume to temperature for an ideal gas while the pressure is held constant
- 2. The graph that best shows the relationship of volume to pressure for an ideal gas while the temperature is held constant
- 3. The graph that best shows the relationship of the number of grams of solute that is soluble in 100 grams of water at varying temperatures if the solubility begins as a small quantity and increases slowly as the temperature is increased

These three questions require you to recall the basic gas laws and the graphic depiction of the relationship expressed in each law, as well as how solubility can be shown graphically.

To answer question 1, you must recognize that the relationship of gas volume to changes in temperature is a direct relationship that is depicted by graphing Charles's Law: $V_1/T_1 = V_2/T_2$. The only graph that shows that type of direct relationship with the appropriate slope is (A).

To answer question 2, you need to understand that Boyle's Law states that the pressure of a gas is inversely proportional to the volume at constant temperature. Mathematically, this means that pressure (P) times volume (V) is a constant, or $P_1V_1 = P_2V_2$. This inversely proportional relationship is accurately depicted in (C). Although (B) shows the values on the x-axis increasing as the y-axis values decrease, it does not fit the graph for an inverse proportion.

Question 3 requires that you have knowledge about solubility curves and can apply the solubility relationship given in words to graph (E).

Type 2. True/false and relationship questions in Part B. 对错问题 On the actual SAT Subject Test in Chemistry, this type of question must be answered in a special section of your answer sheet labeled "chemistry." Type 2 questions are numbered beginning with 101. Each question consists of a statement or assertion in column I and, on the other side of the word BECAUSE, another statement or assertion in column II. Your first task is to determine whether each of the statements is true or false and to record your answer for each in the answer blocks for column I and column II in the answer grid by darkening either the ① or the ② oval. Here you must use your reasoning skills and your understanding of the topic to determine whether there is a cause-and-effect relationship between the two statements.

Here are the directions and two examples of a relationship analysis question.

PART B

<u>Directions</u>: Every question below contains two statements, I in the left-hand column and II in the right-hand column. For each question, decide if statement I is true or false <u>and</u> if statement II is true or false and fill in the corresponding T or F ovals on your answer sheet. <u>Fill in oval CE only if statement II is a correct explanation of statement I.</u>

Sample Answer Grid:

CHEMISTRY * Fill in oval CE only if II is a correct explanation of I.

	I	II	CE*
101.	T E	TE	\bigcirc

• EXAMPLE 1

101. When 2 liters of oxygen gas react completely with 2 liters of hydrogen gas, the limiting factor is the volume of the oxygen

BECAUSE

the coefficients in the balanced equation of a gaseous reaction give the volume relationship of the reacting gases.

The reaction that takes place is

$$2H_9 + O_9 \rightarrow 2H_9O$$

The coefficients of this gaseous reaction show that 2L of hydrogen react with 1L of oxygen, leaving 1L of unreacted oxygen. The limiting factor is the quantity of hydrogen.

The ability to solve this quantitative relationship shows that statement I is not true. However, statement II does give a true statement of the relationship of coefficients in a balanced equation of gaseous chemical reaction. Therefore, the answer blocks would be completed like this:

	I	II	CE*
101.	T F	T) F	0

xvi · INTRODUCTION

• EXAMPLE 2

102. Water is a good solvent of ionic and polar compounds

BECAUSE

the water molecule has polar properties due to the factors involved in the bonding of the hydrogen and oxygen atoms.

Statement I is true because water is such a good solvent that, as you have probably learned, it is sometimes referred to as the universal solvent. This property is attributed mostly to its polar structure. The polar covalent bond between the oxygen and hydrogen atoms and the angular orientation of the hydrogens at 105 degrees between them contribute to the establishment of a permanent dipole moment in the water molecule. This also gives rise to a high degree of hydrogen bonding. These properties combine to make water a powerful solvent for both polar and ionic compounds. Because of your familiarity with these concepts and the processes by which substances go into solution, you know that statement II not only is true but also is the reason that statement I is true. There is a cause-and-effect relationship between the two statements. Therefore, the answer blocks would be marked like this:

	I	II	CE*
102.	T) F)	T)F)	

Type 3: General multiple-choice questions in Part C. 多项选择题 The five-choice items in Part C are written usually as questions but sometimes as incomplete statements. You are given five suggested answers or completions. You must select the one that is best in each case and record your choice in the appropriate oval. In some questions you are asked to select the one inappropriate answer. Such questions contain a word in capital letters, such as NOT, LEAST, or EXCEPT.

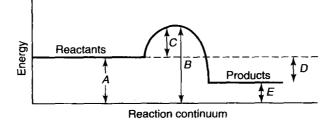
In some of these questions, you may be asked to make an association between a graphic, pictorial, or mathematical representation and a stated explanation or problem. The solution may involve solving a scientific problem by correctly interpreting the representation. In some cases the same representation may be used for a series of two or more questions. In no case, however, is the correct answer to one question necessary for answering a subsequent question correctly. Each question in the set is independent of the others.

PART C

<u>Directions</u>: Every question or incomplete statement below is followed by five suggested answers or completions. Choose the one that is best in each case and then fill in the corresponding oval on the answer sheet.

• EXAMPLE 1

- 40. In this graphic representation of a chemical reaction, which arrow depicts the activation energy?
 - (A) A
 - (B) *B*
 - (C) C
 - (D) D
 - (E) E



To answer this question, you need to know how to interpret the energy levels in this graphic representation of energy-level changes along the time continuum of the reaction. The activation energy is the minimum energy required for a chemical reaction to take place. The reactant molecules come together, and chemical bonds are stretched, broken, and formed in producing the products. During this process the energy of the system increases to a maximum, then decreases to the energy of the products. The activation energy is the difference between the maximum energy and the energy of the reactants. Choice (C) in the graphic depiction shows this energy barrier that has to be overcome for the reaction to proceed. The corresponding oval on the answer sheet should be darkened.

• EXAMPLE 2

- 41. If the molar mass of NH₃ is 17 g/mol, what is the density of this compound at STP?
 - (A) $0.25 \, \text{g/L}$
 - (B) $0.76 \, g/L$
 - (C) 1.25 g/L
 - (D) $3.04 \, g/L$
 - (E) $9.11 \, g/L$

The solution of this quantitative problem depends on the application of several principles. One principle is that the molar mass of a gas expressed in grams/mole will occupy 22.4 L at standard temperature and pressure (STP). The other is that the density of a gas at STP is the mass of 1 L of the gas. Therefore, 17 g of ammonia (NH₃) will occupy 22.4 L, and 1 L is equal to $17 \, \text{g}/22.4 \, \text{L}$ or $0.76 \, \text{g}/\text{L}$. The correct answer is (B).

EXAMPLE 3

Some questions in this part are followed by three or four bits of information labeled by Roman numerals I through III or IV. One or more of these statements may correctly answer the question. You must select from the five lettered choices the one that best answers the question.

- 42. Which bond(s) is (are) ionic?
 - I. H—Cl (g)
 - II. S--Cl (g)
 - III. Cs-F (g)
 - (A) I only
 - (B) III only
 - (C) I and II only
 - (D) II and III only
 - (E) I, II, and III

To determine the type of bonding that exists in these three substances, you must use your knowledge of ionic bonds and the way they are formed. You must also use your knowledge of the relationship of the electronegativity of an element and the position of that element in the periodic chart. Compounds I and II are formed from elements that do not have enough difference in their respective electronegativities to cause the formation of an ionic bond. This can be inferred by checking the positions of the elements (H, Cl, and S) in the Periodic Table and noting how electronegativity varies with an element's position in the table. Compound III, cesium fluoride, consists of elements that appear in the lower right corner and the upper left corner, respectively, of the Periodic Table; therefore, the difference in their electronegativity values is sufficient so that an ionic bond can be predicted between them. Of the choices given, only (B) is a correct answer.

How Can You Use This Book to Prepare for the Test?

如何有效地使用这本书准备考试?

The best way to use this book is a two-stage approach, and the next sections are arranged accordingly. First, you should take the diagnostic test. This will give you a preliminary exposure to the type of test you are planning to take, as well as a measure of how well you achieve on each of the three parts. You will also become aware of the types of questions that the test includes. Use the test-scoring information following the diagnostic test to determine your raw score and your strengths and weaknesses in the specific areas of the test.

Having taken the diagnostic test, you should then follow a study program. A study plan covering the 6 weeks before the test has been developed for you and is given in detail on page 21. It requires a minimum of 1 or 2 hours per night on weekdays but leaves your weekends free.

How Can You Improve Your Problem-Solving Skills?*

如何提高解答难题的能力?

Chemistry is a subject that deals with many problem situations that you, the student, must be able to solve. Solving problems may seem to be a natural process when the degree of difficulty is not very great, and you may not need a structured method to attack these problems. However, for complex problems an orderly process is required.

The following is such a problem-solving process. Each step is vital to the next step and to the final solution of the problem.

^{*}Adapted with permission from *Thinking Skills Resource Guide*, a noncopyrighted publication of Mount Lebanon School District, Pittsburgh, PA.

- Step 1. Clarify the problem: to separate the problem into the facts, the conditions, and the questions that need to be answered, and to establish the goal.
- Step 2. Explore: to examine the sufficiency of the data, to organize the data, and to apply previously acquired knowledge, skills, and understanding.
- Step 3. Select a strategy: to choose an appropriate method to solve the problem.
- Step 4. Solve: to apply the skills needed to carry out the strategy chosen.
- Step 5. Review: to examine the reasonableness of the solution and to evaluate the effectiveness of the process.

The steps of the problem-solving process listed above should be followed in sequence. The subskills listed below for each step, however, are not in sequence. The order in which subskill patterns are used will differ with the nature of the problem and/or with the ways in which the individual problem solver thinks. Also, not every subskill need be employed in solving every problem.

Clarify the Problem

- a. Identify the facts. What is known about the problem?
- b. Identify the conditions. What is the current situation?
- c. Identify the questions. What needs to be answered before the problem can be solved?
- d. Visualize the problem.
 - 1. Make mental images of the problem.
 - 2. If desirable or necessary, draw a sketch or diagram, make an outline, write down symbols or equations that correspond to the mental images.
- e. Establish the goal. The goal defines the specific result to be accomplished through the problem-solving process. It defines the purpose or function the solution is expected to achieve and serves as the basis for evaluating the solution.

Explore

- a. Review previously acquired knowledge, skills, and understanding. Determine whether the current problem is similar to a previously seen type.
- b. Estimate the sufficiency of the data. Does there seem to be enough information to solve the problem?
- c. Organize the data. There are many ways in which data can be organized. Some examples are outline, written symbols and equations, chart, table, graph, map, diagram, and drawing. Determine whether the data organized in the way(s) you have chosen will enable you to partially or completely solve the problem.
- d. Determine what new data, if any, need to be collected. What additional information may be needed to solve the problem? Can the existing data be reorganized to generate new information? Do other resources need to be consulted? This step may suggest possible strategies to be used to solve the problem.

Select a Strategy

A strategy is a goal-directed sequence of mental operations. Selecting a strategy is the most important and also the most difficult step in the problem-solving process. Although there may be several strategies that will lead to the solution of a problem, the skilled problem solver uses the most efficient strategy. The choice of the most efficient strategy is based on knowledge and experience as well as a careful application of the clarify and explore steps of the problem-solving method. Some problems may require the use of a combination of strategies.

xx • INTRODUCTION

The following search methods may help you to select a strategy. They do not represent all of the possible ways in which this can be done. Other methods of strategy selection are related to specific content areas.

- a. Trial-and-error search: Such a search either doesn't have or doesn't use information that indicates that one path is more likely to lead to the goal than any other path.

 Trial-and-error search comes in two forms, blind and systematic. In blind search, the searchers pick paths to explore blindly, without considering whether they have already explored these paths. A preferable method is systematic search, in which the searchers keep track of the paths they have already explored and do not duplicate them. Because this method avoids multiple searches, systematic search is usually twice as efficient as blind search.
- b. Reduction method: This involves breaking the problem into a sequence of smaller parts by setting up subgoals. Subgoals make problem solving easier becaue they reduce the amount of search required to find the solution.
 - You can set up subgoals by working part way into a problem and then analyzing the partial goal to be achieved. In doing this, you can drop the problem restrictions that do not apply to the subgoal. By adding up all the subgoals, you can solve the "abstracted" problem.
- c. Working backward: When you have trouble solving a problem head-on, it is often useful to try to work backward. Working backward involves a simple change in representation or point of view. Your new starting point is the original goal. Working backward can be helpful because problems are often easier to solve in one direction than another.
- d. Knowledge-based method: This strategy uses information stored in the problem solver's memory, or newly acquired information, to guide the search for the solution. The problem solver may have solved a similar problem and can use this knowledge in a new situation. In other cases, problem solvers may have to acquire needed knowledge. For example, they may solve an auxiliary problem to learn how to solve the one they are having difficulty with.
 - Searching for analogous (similar) problems is a very powerful problem-solving technique. When you are having difficulty with a problem, try to pose a related, easier one and hope thereby to learn something that will help you solve the harder problem.

Solve

Use the strategy chosen to actually solve the problem. Executing the solution provides you with a very valuable check on the adequacy of your plan. Sometimes students will look at a problem and decide that, since they know how to solve it, they need not bother with the drudgery of actually executing the solution. Sometimes the students are right, but at other times they miss an excellent opportunity to discover that they were wrong.

Review

- a. Evaluation. The critical question in evaluation is this: "Does the answer I propose meet all of the goals and conditions set by the problem?" Thus, after the effort of finding a solution, you must turn back to the problem statement and check carefully to be sure your solution satisfies it.
 - With easy problems there is a strong temptation to skip evaluation because the probability of error seems small. In some cases, however, this can be costly. Evaluation may prove that errors were present.
- b. Verification of the reasonableness of the answer. It is easy to become so involved with the process and mathematics of a problem that an answer is recorded that is totally illogical. To avoid this mistake, you should simplify the numbers involved and solve for an answer. Having done this, compare your estimated result with your answer to ensure that your answer is feasible.

For example, a problem requires the following operations:

$$5.12 \times 10^5 \times 3.98 \times 10^6$$
 divided by 910

And doing all the math, you get an answer of

$$0.02239 \times 10^{11}$$
 or 2.24×10^{9}

To estimate the answer, first simplify the numbers to one significant figure (significant figures are discussed in Chapter 1). This gives

$$5 \times 10^5 \times 4 \times 10^6$$
 divided by 9×10^2

which is

$$20 \times 10^{11}$$
 divided by $9 \times 10^2 = 2.2 \times 10^9$

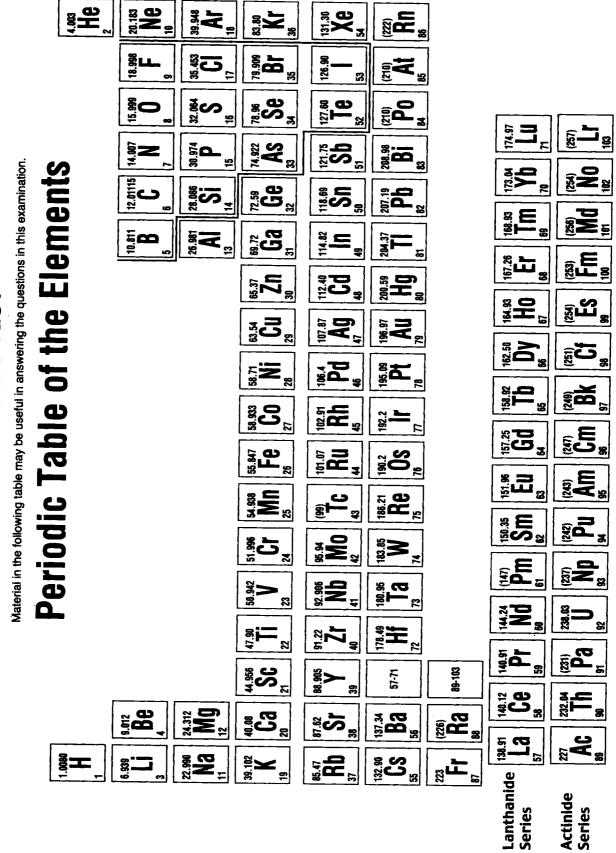
This is the estimated answer, which validates the answer above.

When you are dealing with test items that provide multiple-choice answers, you can often use estimation to arrive at the answer without doing the more complicated mathematics.

- c. Consolidation. Here the basic question to be answered is: "What can I learn from the experience of solving this problem?" The following more specific questions may help you to answer this general one:
 - 1. Why was this problem difficult?
 - 2. Was it difficult to follow a plan?
 - 3. Was it difficult to decide on a plan? If so, why?
 - 4. Did I take the long way to the answer?
 - 5. Can I use this plan again in similar problems?

The important thing is to reflect on the process that you used in order to make future problem solving easier.

CHEMISTRY TEST



Contents 目录

	Introduction 入门	x
	General Information About the Test 关于考试的基本信息	×
	Is the SAT Subject Test in Chemistry Required?参加SAT化学考试是必需的	
	When Should You Take the Test? 什么时间应该参加考试?	x
	When Is the Test Offered? 什么时间举办考试?	хi
	How Do You Register? 如何登记?	xi
	How Should You Prepare for the Test? 如何准备SAT考试?	хi
	What Topics Appear on the Test, and to What Extent? 考试会考什么内容? 难度如何?	×ii
	What General Information Should You Have About the Test? 关于考试需要具备哪些常识?	xiii
	What Types of Questions Appear on the Test? * 考试会考哪些类型的问题?	xiii
	Type 1. Matching Questions in Part A 配对问题	xiv
	Type 2. True/False and Relationship Questions in Part B 对错问题	XV
	Type 3. General Multiple-Choice Questions in Part C 多项选择题	xvi
	How Can You Use This Book to Prepare for the Test? 如何有效地使用这本书准备考试?	xviii
	How Can You Improve Your Problem-Solving Skills?	xviii
	如何提高解答难题的能力?	A V 1111
	A Diagnostic Test 摸底考试	1
	Information About This Pretest 关于预备考试的信息	1
	Answer Sheet for Diagnostic Test 摸底考试的答题纸	1
	The Diagnostic Test 摸底考试	3
	Answers and Explanations to Test 答案和释疑	13
	Calculating Your Score 估分	18
	Diagnosing Your Needs 明白自己的需要	19
	Planning Your Study 制订学习计划	20
	Final Preparation—The Day Before the Test 最后的准备——考试之前 (Including a list of helpful tips for taking the test)	22
	After the Test 考试之后	22
Chapter 1	Introduction to Chemistry 化学入门	23
.	Matter 物质	23
	Definition of Matter 23 States of Matter 23 Composition of Matter 24 物质的定义 物质的状态 物质的构成	20
	Chemical and Physical Properties 25 化学性质和物理性质 Conservation of Mass 26 质量守恒 Chemical and Physical Changes 25 化学变化和物理变化 Chemical and Physical Changes 25	