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烘焙食品科学与工艺学

STUDY HELP QUESTIONS AND ANSWERS

英语辅助学习问答

张 守 文 编

黑龙江科学技术出版社

内 容 提 要

本书将烘焙食品科学与工艺学和英语有机地结合起来，使学生在学习烘焙食品科学与工艺学的同时，又进一步巩固和提高了英语水平，保证了学生在校期间英语教学不断线．因此，本书具有新颖性、科学性和实用性．全书共分六大部分，包括基础科学、原辅材料学、面包生产工艺、各式面包产品、糕点生产工艺以及部分参考答案．

本书主要作为大学食品科学与工程专业本科和研究生教学辅助用书，亦可作为专业英语用书，也可作为科研单位和食品工程技术人员的参考书．

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前　言

英语在现代社会中的作用越来越重要，特别是在我国改革开放的新形势下，它的作用尤为突出。它既可以沟通和加强不同国家和人民之间的友谊，促进各方面的交流，又是学习和借鉴不同国家的现代科学技术的重要工具。因此，英语水平的高低和普及率是一个国家整体发达程度的标志之一，也是一个大学教育质量高低的重要标志。

为了帮助大学本、专科学生和研究生更好地学习专业英语，特别是如何用英语学好专业课，使专业英语和专业课的教学更加有机地结合起来，编者根据在美国堪萨斯州立大学（Kansas State Vniversity）、美国烘焙学院（American Institute of Baking）、泰国曼谷烘焙学校（Bangkok Baking School）进修学习烘焙食品科学和工艺学时收集的第一手资料，编成《英语辅助学习问答》一书，帮助学生用英语来学习食品工程专业的主干课程之一的烘焙食品科学与工艺学。这本《英语辅助学习问答》的内容包括烘焙食品的基本科学、烘焙计算、原辅材料、面包工艺学、糕点工艺学等内容，涉及到数学、化学、物理、食品化学等多学科，内容广泛，英语专业词汇量较大，有利于学生有的放矢地学习专业英语；同时，在书后列出了绝大部分参考答案，帮助同学们更好地理解烘焙食品科学与工艺学的各方面知识，可谓一举两得。

本书是国内高校食品工程专业第一本烘焙食品工艺学英语辅助学习用书，是本人在总结多年本科生、研究生教学实践中采用英语辅助教学法的基础上，为进一步提高教学质量而编写的，是本人 10 年的教学研究成果。在今后的教学过程中，还要不断实践、不断探索、不断总结和提高。由于时间仓促，本人水平有限，该书难免存在缺点甚至错误，敬请同学们和有关人士批评指正，不吝赐教。

编　者

1995 年 5 月

Content

Part One Basic Science

1st ELEMENTS – COMPOUNDS – AND MIXTURES

Definitions:

An element is a substance which cannot be decomposed into simpler substances by any ordinary means.

A compound is a substance composed of two or more elements chemically combined in definite proportions by weight; so combined that the elements can no longer be identified by their original individual properties.

A mixture is a substance consisting of two or more elements or compounds that are not chemically united.

Procedure:

1.Place some powdered sulfur on a sheet of paper. Examine, noting its properties. Pass the magnet underneath the sheet of paper.

Results?

2.Repeat Experiment 1, using iron filings instead of sulfur.

Results?

3. Mix thoroughly on a piece of paper about 1 / 4 of a test–tubeful (8g.) of powdered sulfur and 1 / 5 of a test–tubeful (15g.) of iron fillings. Use half of this mixture for Experiment 3 and half for Experiment 4.Pass the magnet under a paper containing the mixture.

Results?

4.Pour the second half of the dry mixture of sulfur and iron into a test–tube. Heat vigorously for about 5 minutes until the excess sulfur is burned away and the contents glow.Allow the test–tube to cool somewhat; then break the test–tube by immersing the hot end to cool somewhat; then break the test–tube by immersing the hot end into a cold beaker of water. Now repeat Experiment 1 (magnet) with some of the contents.

Results?

Observations and Questions on Experiments:

1. Sulfur (is, is not)_____ attracted to magnet.

2. Iron (is, is not)_____ attracted to magnet.

3. The _____ is used as an identifying property of iron.

4. When a magnet is placed near a mixture of iron and sulfur, the magnet_____.

5. When iron and sulfur are mixed, the ingredients of the mixture (lose, retain) _____ their original properties.

6. After the mixture of iron and sulfur was heated, we saw evidences of a (physical, chemical) _____change. One indication of this kind of change is _____.

7. After heating the mixture of iron and sulfur, the identifying properties of the iron and sulfur are (lost, retained) _____ .

8. When iron and sulfur are heated together (an element, compound, mixture) _____ is formed.

9. All substances may be classified according to composition as _____ , _____ and _____.

10. In a mixture the ingredients _____ their original properties.

11. In a compound the ingredients _____ their original properties.

12. A mixture is the result of a _____ change.

13. Acompound is the result of a _____ change.

14. An element is a substance which cannot be _____ by the ordinary types of chemical change into _____. The two classes of elements are _____ and _____.

15. The oxygen in air retains its original properties. Air is therefore a _____.

16. The oxygen of water has lost its original properties. Water is a _____.

17. In the formation of a compound, the ingredient elements are always united in definite proportions by weight, This is a statement of the law of definite proportions. A mixture (does, does not)_____ conform to this law.

18. Write the word element, compound, or mixture as such in the following:

iron	_____	silver	_____
shortening	_____	soil	_____
oxygen	_____	zinc	_____
paper	_____	sugar	_____
aluminum	_____	yeast food	_____
baking powder	_____	salt water	_____
brass	_____	milk	_____
yeast	_____	eggs	_____
nitrogen	_____	air	_____
potassium bromate	_____	bread	_____
iron rust	_____	baking soda	_____
drinking water	_____	carbon dioxide	_____
lime (CaO)	_____	flour	_____
malt syrup	_____	salt	_____
distilled water	_____		

19.Write the symbol for the following elements:

a. Iron	_____	g. Silver	_____
b. Sulfur	_____	h. Gold	_____
c. Mercury	_____	i. Nitrogen	_____
d. Carbon	_____	j. Chlorine	_____
e. Hydrogen	_____	k. Lead	_____
f. Oxygen	_____	l. Magnesium	_____

20. Write the name of the element that corresponds with the following symbols:

a. Br	_____	g. He	_____
b. Al	_____	h. I	_____
c. Ca	_____	i. p	_____
d. Na	_____	j. Ba	_____
e. K	_____	k. F	_____
f. Zn	_____	l. Pt	_____

21. Name four physical and four chemical changes that occur during the production of white bread.

physical changes _____ Chemical changes

a. e.

b. f.

c. g.

d. h.

22. Define the following words in your own terms:

a. Element

b. Atom

c. Compound

d. Molecule

f. Physical Change

g. Chemical Change

23. Name the element that supports combustion.

24. Name one gaseous element that is combustible.

25. Name the test used to determine the presence of oxygen.

26. Name two elements that occur in nature as liquids and give theirsymbols.

a.

b.

27. List four elements that exist as gases, and a common use for each.

a.

b.

c.

d.

28. List six metals with their symbols.

a. d.

b. e.

c. f.

2nd ACIDS – BASES – SALTS

Procedure:

1. Acids: Dip a glass rod in a bottle of dilute hydrochloric acid and then touch the rod to pieces of red and blue litmus paper placed on a clean glass plate. Result? Repeat using a few drops of each of the acids listed in the table below.

Acid	Formula	Taste	Color Change With Litmus	Ions in Solution
Hydrochloric Acid				
Sulfuric Acid				
Nitric Acid				
Acetic Acid (Vinegar)				

2. Bases: Repeat Exp.1 above using solutions of the bases listed below and then complete the table below.

Base	Formula	Taste	Color Change With Litmus	Ions in Solution
Sodium Hydroxide				
Potassium Hydroxide				
Calcium Hydroxide				
Ammonium Hydroxide				

3. Titration Experiment: Half fill a 150 c.c. beaker with distilled water and proceed to the titration apparatus set up in the laboratory. Add 2 – 3 drops of phenolphthalein indicator, then 10 c.c of hydro chloric acid (HCl) (of standard strength) from the buret set up for that purpose. Then by means of the second buret containing sodium hydroxide (NaOH) of known strength, add the base slow-

ly and with constant stirring (use stirring rod or magnetic stirring bar) until solution reaches a permanent light pink color. (Note: Take care when you approach the end point (neutrality), as an excess of base will give a red color.)

Number of c.c. of base (NaOH) needed to neutralize 10 c.c. of acid (HCl) _____ c.c. Taste a drop of the solution, Result? Pour some of the solution into an evaporating dish on a wire gauze supported by a ring stand and evaporate the solution to dryness.

Examine and taste the residue.

4. Repeat the above "Titration Experiment" using 15 grams of dough or 15 grams of bread provided to replace the hydrochloric acid. Record your results as milliliters of standard base necessary to titrate the sample to a phenolphthalein end point.

Is the phenolphthalein end point difficult to determine accurately?_____.

Why?_____.

5. Once again repeat the "Titration Experiment" using the dough or bread sample but determine the end point by use of a pH meter (pH of 7.0).

Which of the above titration exercises could also be considered a "neutralization" experiment? _____.

Why?_____.

What is the pH for phenolphthalein end point? _____.

Observations and Questions on Experiments:

1. Sodium hydroxide solution has a _____ taste, and turns litmus from _____ to _____. Hydrochloric acid solution has a _____ taste, and turns litmus from _____ to _____. When these two are mixed in equivalent proportions, the mixture has a _____taste, and the effect on the litmus should be _____.

2. When an acid and a base react with the end point being a pH of 7, the reaction is called a _____reaction.

3. Complete the equation: NaOH + HCl = _____ + _____.

4. When a neutral mixture of NaOH and HCl is evaporated to dryness, the _____ is driven off and the residue tastes _____. The residue is the substance _____ _____.

5. Water solutions of acids contain _____ ions, change litmus from _____ to _____ and have a _____ taste. Similarities in the behavior of acids are attributed to _____ ions which they possess in common.

6. Water solutions of bases contain _____ ions, change litmus from _____ to _____ and have a _____ taste. Similarities in the behavior of bases are attributable to the _____ ions which they possess in common.

7. When an acid is titrated with a base to an end point of PH7 (_____ reaction), the characteristics _____ ions of the acid combine with the characteristic_____ ions of the base to form neutral_____. The _____ of the base combine with the _____ of the acid to form a salt.

8. The gastric juice in the stomach contains a little hydrochloric acid. The purpose is _____.

9. Some of the acids present in a fermentiong dough may be _____. Why is it important that some of these acids be present? _____

10. Not every substance that contains hydrogen is an acid. The hydrogen of the substance must form _____ when in water solution to be acidic hydrogen.

11. Some acids found in the home are:_____ acid in vinegar; _____ acid in grapes; _____ acid in lemons, oranges, and cranberries; _____ acid in rancid butter; _____ acid used for cleaning metals; _____ acid for disinfecting purposes; and _____ in sour milk.

12. Housekeepers store pickles in glass or earthenware containers rather than

in metal ones because _____.

13. Caustic soda is the common name for _____ and is so called because it has a corrosive action on skin and organic matter. The name of a useful household cleansing agent containing about 94% sodium hydroxide is _____.

14. An alkali is a substance whose water solution changes litmus from _____ to _____. An alkali is a (strong, weak) _____ base.

15. Alkalies react with _____ and are therefore useful in cleaning.

16. If you spill some acid on your clothing, you should neutralize it with a _____ such as _____.

Which does not affect? _____.

17. Indigestion is usually associated with excessive (acid, basic) _____ condition of the stomach. To relieve this condition, mild (acids, bases) _____, such as _____ , _____ or _____ are taken.

18. starch and sugar contain hydrogen. Are they acids? _____.

19. HCl is a volatile acid. This means that it _____.

20. What acid is used in storage batteries, etc., and is non-volatile.If some of this diluted acid is spilled or merely left in the air, the water will evaporate and the acid become more concentrated. What harm might this do? _____.

21. HCl and NH_4OH (ammonia water) are volatile. When an opened bottle of each are held close together what is formed?

_____ _____.

3rd SOLUTIONS, SUSPENSIONS AND COLLOIDAL SUSPENSIONS

Procedure:

1. Select four (4) clean test tubes and place salt in the first, sand in the second, starch in the third, and one or two very small crystals of potassium permanganate in the fourth test tube. Fill one–half full with water. place your thumb over the mouth of each and shake for a minute or two. Set the containers aside for about 10 minutes. Examine each test tube. Are the particles visible? Have they settled upon standing? Is the color of the potassium permanganate mixture uniform throughout? Taste the top layer of the salt mixture. Then pour out some of the contents and taste the remaining part. (Leave some for Exp. 3.) Is there any difference in taste?

2. Place a very small quantity of starch in a small beaker. Fill the beaker with water and stir well. Boil the mixture, but take care as it has a tendency to boil over. Compare this mixture of starch and hot water (colloidal suspension) with the mixture of starch and cold water in Exp. 1 with respect to size, visibility, and settling of particles.

3. Filter a little of each mixture of Exps. 1 and 2 into test tubes.Which ones pass through the filter paper? How do you know? Test both starch filtrates (the portion of material that passes through the filter paper) and the filter papers (hot water and cold water solutions) with dilute tincture of iodine. Results?

Observations and Questions:

1. After mixing thoroughly with water, the particles of _____ and _____ are visible and the particles of _____ and _____ are not visible.

2. After mixing thoroughly with water, the particles of _____ and _____ are distributes equally or uniformly throughout the water. In the case of the salt this was shown by _____ and in the case of the potassium permanganate this was shown by _____ .

3. After mixing thoroughly with water, the particles of _____ and