

### Science Unit 3 Review

#### Modified True/False

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

- T 1. Orange juice is a *heterogeneous mixture*.  
\_\_\_\_\_
- T 2. To the naked eye, milk appears to be *homogeneous*. When viewed under a microscope, though, it is observed to be *a mixture of mixtures*.  
\_\_\_\_\_
- F 3. A solute dissolves ~~more slowly~~ *more quickly* when the mixture is stirred.  
\_\_\_\_\_
- F 4. Solidified honey contains some water and a lot of sugar crystals. Solidified honey is an ~~unsaturated~~ *saturated* solution.  
\_\_\_\_\_
- F 5. The attraction between sugar and water particles in a solution of sugar and water is ~~weaker~~ *stronger* than the attraction between sugar and sugar particles in solid sugar.  
\_\_\_\_\_
- F 6. At higher water temperatures, the solubility of sugar ~~decreases~~ *increases*, but the solubility of carbon dioxide ~~increases~~ *decreases*.  
\_\_\_\_\_
- F 7. Paper chromatography is best used to separate ~~heterogeneous~~ *homogeneous* liquid mixtures.  
\_\_\_\_\_

#### Multiple Choice

Identify the choice that best completes the statement or answers the question.

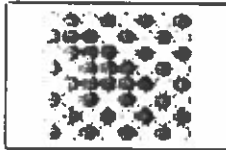
- A 8. Which is a method for separating mixtures?  
a. filtering  
b. shaking  
c. heating  
d. stirring
- A 9. Which is an example of a heterogeneous mixture?  
a. chunky peanut butter  
b. maple syrup  
c. drinking water  
d. stainless steel

- D 10. Which is an example of a homogeneous mixture?
- battered popcorn
  - pure butter
  - homogenized milk
  - drinking water

- D 11. Which is a list of **ONLY** heterogeneous mixtures?
- bag of garbage, alcohol, potting soil
  - gasoline, nuts and bolts, sterling silver
  - corn syrup, mouthwash, ground pepper
  - banana split, homogenized milk, hot dog relish

- C 12. Chocolate layer cake contains milk, flour, butter, eggs, cocoa, sugar, icing sugar, and other ingredients. Which term describes this dessert?
- heterogeneous mixture
  - homogeneous mixture
  - mechanical mixture
  - pure substance

- D 13. Which diagram represents a homogeneous mixture?



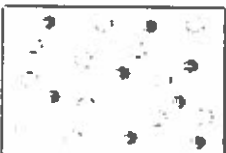
a.



b.



c.



d.

- D 14. Which statement is part of the particle theory of matter?
- The particles are always tightly packed together and have uniformity.
  - All matter is made of tiny particles that can be seen with a microscope.
  - Particles at higher temperatures move slower than particles at lower temperatures.
  - Two different substances are composed of different kinds of particles.

- D 15. Which term describes a piece of iron?
- heterogeneous mixture
  - homogeneous mixture
  - solid solution
  - pure substance

- B 16. Which term would describe a sample of alcohol and water?
- heterogeneous mixture
  - homogeneous mixture
  - cloudy substance
  - pure substance

- D 17. Which statement best describes why solvents are used for cleaning purposes?
- Most solvents are acids, and, therefore, are effective in getting rid of dirt.
  - Solvents are made up of very strong chemicals.
  - Solvents are highly concentrated.
  - Solvents can dissolve solutes, such as household dirt and grime.

- B 18. What happens to a saturated solution when one more crystal of solute is added?
- More crystals form.
  - The crystal remains undissolved.
  - The crystal dissolves.
  - The crystal floats.

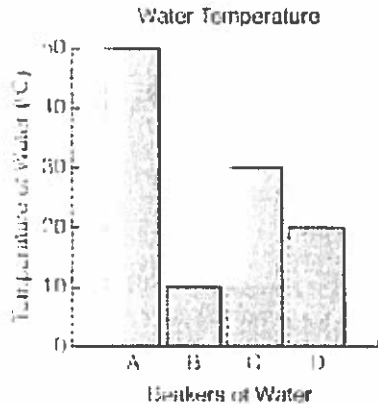
- A 19. Which term describes how much solute is dissolved in a solution?
- concentration
  - excess solute
  - saturated
  - solubility

- C 20. Which does **NOT** speed up dissolving?
- Breaking the solute into pieces.
  - Heating the solvent.
  - Increasing the mass of solute.
  - Stirring the mixture.

- B 21. Which of these changes would cause the largest **INCREASE** in the rate of dissolving?
- The solvent is cooled, then stirred and then left to sit.
  - The solute is in small pieces and the solvent is heated.
  - The solute is in larger pieces and the mixture is stirred.
  - The solute and solvent are heated and left undisturbed.

- B 22. A solution of salt in water is at  $100^{\circ}\text{C}$ . Heat is added to keep the mixture at  $100^{\circ}\text{C}$ , so that half the water evaporates. How would the concentration of the salt solution change?
- concentration of salt decreases
  - concentration of salt doubles
  - concentration of salt is halved
  - concentration of salt stays constant

- A 23. The graph shows the temperature of water in four beakers. In which beaker are water particles moving most rapidly?

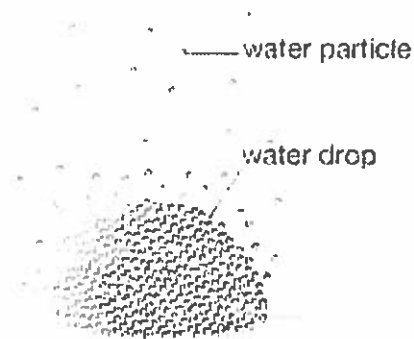


- Beaker A
- Beaker B
- Beaker C
- Beaker D

- B 24. Sea shells are made of calcium carbonate. Sea shells appear to dissolve very slowly, lasting for several years. Which statement provides the BEST explanation for this observation?
- Calcium carbonate is very soluble in water.
  - Calcium carbonate is insoluble in water.
  - Sea water is saturated in calcium carbonate.
  - Sea water is unsaturated in calcium carbonate.

- A 25. The solubility of potassium chlorate is  $110\text{ g} / 100\text{ g}$  of water at  $30^{\circ}\text{C}$ . What is the concentration of a saturated solution of potassium chlorate at that temperature?
- equal to  $220\text{ g} / 200\text{ g}$
  - less than  $110\text{ g} / 100\text{ g}$
  - more than  $110\text{ g} / 100\text{ g}$
  - no more than  $200\text{ g} / 200\text{ g}$

- B 26. What change of state is illustrated in the diagram, if the particles are moving up and away from the drop?



- a. condensation  
b. evaporation  
c. freezing  
d. melting
- B 27. Which of the following examples would likely involve separation by filtration?
- a. Collecting pure water from salt water.  
b. Separating dust from air in a household air purifier.  
c. Separating iron filings from sand.  
d. Skimming all the fat off soup.
- B 28. When beef jerky is made, the water is removed from the meat. What method of separation does this demonstrate?
- a. distillation  
b. evaporation  
c. filtration  
d. mechanical sorting
- D 29. When is filtration an effective method of separating materials?
- a. when the mixture is allowed to settle on its own  
b. when the mixture's solute is a solid  
c. when the mixture contains at least one liquid  
d. when the mixture contains particles of different sizes

### Completion

Complete each statement.

30. Carbonated water is an example of a solution of a liquid and a(n) gas.
31. The element copper is an example of a(n) pure substance.

32. A teaspoon of sugar is placed in a glass of water, and 10 minutes later, some of the sugar can still be seen. At this time, the glass contains a(n) heterogeneous mixture.
33. A mixture of sugar and water is stirred for one minute, until the sugar is no longer visible. The mixture is now called a(n) homogeneous.
34. When vinegar and oil are shaken together, they form a cloudy substance that gradually separates into oil and vinegar again. This is an example of a(n) heterogeneous.
35. If you have a concentrated solution, you can make a dilute solution by adding more solvent.
36. You have a clear solution. You add one more crystal of solute to it, and the crystal dissolves. The original solution was unsaturated.
37. When you open a bottle of soda water, bubbles of carbon dioxide "fizz" appear. The solubility of dissolved carbon dioxide is decreasing.
38. Any gas will condense to a liquid if the temperature is decreased enough.
39. Paper Chromatography can be used to separate the coloured substances in a mixture.
40. Gravel consists of sand, pebbles, and stones of various sizes. This mixture can be separated by the method of filtration.

### Matching

Match each term to an appropriate description. Each term may be used more than once.

- |                        |                          |
|------------------------|--------------------------|
| a. pure substance      | c. heterogeneous mixture |
| b. homogeneous mixture |                          |

- BA 41. ~~pure~~ air
- C 42. piece of granite rock
- B 43. alcohol and water mixture
- C 44. milk

Match the term with an appropriate description. Each term is only used once.

- |                  |              |
|------------------|--------------|
| a. saturated     | e. dissolves |
| b. solvent       | f. solute    |
| c. solubility    | g. insoluble |
| d. concentration | h. dilute    |

- B 45. a substance in which a solute dissolves

- A 46. a solution that can dissolve no more solute
- D 47. the quantity of solute that is dissolved in a certain quantity of solvent
- C 48. the maximum mass of a substance that will dissolve in 100 g of water at a certain temperature
- E 49. a solute does this in solvent
- G 50. substance that cannot dissolve

Match the term with an appropriate description. Each term may only be used once.

- |                                         |                           |
|-----------------------------------------|---------------------------|
| a. evaporation                          | e. flotation              |
| b. filtration                           | f. paper chromatography   |
| <del>z. / fractional distillation</del> | <del>z. / screening</del> |
| d. screening                            | h. simple distillation    |

- B 51. recovers suspended solids from a fluid.
- ~~LL~~ ~~12~~ separates dense liquids from a fluid mixture using gravity.
- D 53. separates substances using particle size
- ~~LL~~ ~~14~~ separates a solution of liquids using differences in their boiling points
- A 55. recover the solid solute from a solution, but not the solvent.
- H 56. recover both the solute and solvent from a solution.
- E 57. When one of the substances can float on water.
- F 58. A method used to separate a homogeneous liquid mixture.