

Concept Review

Name _____

Class _____

Date _____

Section: What Is Chemistry?

Complete each statement below by underlining the correct word or phrase in brackets.

- A chemical is any substance that has [definite, indefinite] composition.
Changes in chemicals, or chemical reactions, take place [only in test tubes, all around us].
- The type and arrangement of [particles, crystals] in a sample of matter determine the properties of the matter. Most of the matter you encounter is in one of [numerous, three] states of matter.
- The characteristics of a solid include [fixed, variable] volume and shape. Particles that make up solids are held [loosely, tightly] in a [flexible, rigid] structure, so the particles can [vibrate only slightly, flow past each other].
- Liquids have a [fixed, variable] volume but a [fixed, variable] shape. This situation occurs because particles in a liquid are held [tightly, loosely] and [can, cannot] slip past each other.
- Gases have [fixed, variable] volume and [fixed, variable] shape. Gas particles may move apart to fill any container they occupy. This behavior occurs because gas particles are [close together, far apart] and are [attracted, not strongly attracted] to one another.
- [Physical, Chemical] changes are changes in which the identity of a substance does not change. Thus the changes of state are [physical, chemical] changes.
- In a [physical, chemical] change, the identities of substances change and new substances form.
- In the word equation *hydrogen + oxygen + heat* → *water*, hydrogen is a [reactant, product], and water is a [reactant, product]. This is an example of a [physical, chemical] change.
- A [physical, chemical] reaction rearranges the atoms that make up the reactant or reactants. After a chemical reaction, [the same, different] atoms are present in the product or products. Atoms [are, are not] destroyed or created, so mass [does, does not] change during a chemical reaction.
- Chemical changes sometimes produce a gas, which you can detect by observing [bubbles, a precipitate] or by a change in [color, odor].
- When two clear solutions mix and a precipitate forms, the mixture becomes [clear, cloudy].
- When energy is released during a chemical reaction, temperature [increases, decreases]. Chemical reactions may also absorb energy, which is indicated by a(n) [increase, decrease] in temperature.
- A color change in a reaction system, such as when an indicator changes color, may indicate that a [chemical, physical] reaction has occurred and [new, no new] substances have formed.

Mark each change below *P* if it is physical and *C* if it is chemical.

- milk souring _____
- gasoline burning _____
- ice melting _____
- lighting a match _____
- water evaporating _____
- chopping wood _____
- burning wood _____
- breath fogging a mirror _____
- cooking an egg _____
- bleaching a stain _____

Answer the following questions in the space provided.

- Explain how chemicals and chemical reactions are an important part of your life.

- In the spaces below draw and label a microscopic view showing the particles in a solid, a liquid, and a gas.

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Skills Worksheet

Concept Review

Chem Ch. 1 Sec. 2

Section: Describing Matter

Answer the following questions in the space provided.

1. Describe two characteristic properties of matter.

2. Briefly explain the difference between mass and weight.

3. Briefly explain the difference between quantity and unit.

4. Briefly explain why density is a derived unit.

5. What special meaning does the slope of a graph of mass versus volume have?

6. List three examples of physical change and three examples of chemical change.

7. What are the differences between physical and chemical properties? Give an example of a chemical property.

For each statement that is true, write T in the blank next to the item number. For each statement that is false, write F in the blank next to the item number and correct the underlined word to make the statement correct.

8. The terms odorless and colorless are quantitative terms.

9. To say that the mass of a gold nugget is 5.0 grams is to use a quantitative term.

10. The kelvin is used to express length in SI.

11. The pound is used to express forces such as weight in SI.

12. The liter is used to express volume in SI.

Solve the following problems, and write your answer in the space provided.

13. How many millimeters are there in 2.0 meters?

14. How many grams are there in 5.0 kilograms?

Concept Review

*Chem. ch 1 sect 3
P 21-28*

Section: How is Matter Classified?

Write the name of the element for each chemical symbol listed below.

- 1. C _____
- 2. S _____
- 3. N _____
- 4. Au _____
- 5. Hg _____
- 6. Sn _____

Write the symbol of each element listed below.

- 7. silver _____
- 8. lead _____
- 9. potassium _____
- 10. iron _____
- 11. sodium _____
- 12. copper _____

Write the answer to the following questions in the space provided.

- 13. How does an atom differ from an element?

- 14. How does an atom differ from a molecule?

- 15. What is an allotrope?

16. When is a sample of matter considered a pure substance?

17. What is the difference between a mixture and a compound?

18. Briefly explain why a beaker containing sand and water is a mixture although sand itself is a pure substance.

19. Briefly explain why a compound has characteristic properties.

Label whether each material below is a pure substance, a homogeneous mixture, or a heterogeneous mixture.

- 20. C_2H_2 _____
- 21. Au _____
- 22. Hg _____
- 23. CH_3COOH _____
- 24. carbonated beverage _____
- 25. raisin bran cereal _____
- 26. stainless steel _____
- 27. H_2O_2 _____
- 28. orange juice _____
- 29. sugar _____
- 30. gasoline _____

Skills Worksheet

Concept Review

Section: Energy Chem Ch. 2 Sect. 1 p 38-45

Complete each statement below by writing the correct term in the space provided.

- The capacity to do work is energy.
- A change in matter from one form to another without a change in chemical properties is a physical change.
- A change that occurs when one or more substances change into new substances with different properties is a chemical change.
- A change in matter in which energy is absorbed is a(n) endothermic process.
- A change in matter in which energy is released is a(n) exothermic process.
- Energy must be added to a solid to melt it. This addition gives the particles kinetic energy, allowing them to move out of the crystalline structure.
- To freeze a substance, energy must be removed from the substance.

Write the answers to the following questions in the space provided.

- State the law of conservation of energy.

- What is heat?

- Define temperature.

11. What is the difference between temperature and heat?

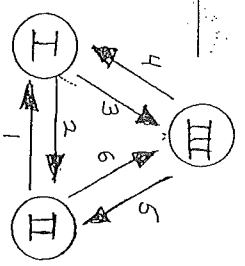
12. Convert the following temperatures as indicated.

- $100^{\circ}\text{C} =$ _____ K
- $293.15\text{ K} =$ _____ $^{\circ}\text{C}$
- $55^{\circ}\text{C} =$ _____ K
- $459\text{ K} =$ _____ $^{\circ}\text{C}$
- $3\text{ K} =$ _____ $^{\circ}\text{C}$
- $-39^{\circ}\text{C} =$ _____ K

13. Define specific heat.

14. Substance A has a specific heat of $0.650\text{ J/g}\cdot\text{K}$, and substance B has a specific heat of $0.325\text{ J/g}\cdot\text{K}$. If 100 J of energy is applied to a 10 g sample of each substance, which substance will have a higher temperature? Why?

For questions 1-6, label the physical changes on the diagram.



- _____ A. Freezing
- _____ B. Sublimation
- _____ C. Vaporization
- _____ D. Condensation
- _____ E. Melting
- _____ F. Size reduction
- _____ G. Deposition
- _____ H. Dissolving
- _____ I. Dispersion

Physical changes between three states of matter
 I - Lowest energy state of matter
 III - Highest energy state of matter

- Label the diagram "Liquid, Solid, Gas"
- List the 3 endothermic processes on the diagram