Chemistry & Chemical Reactivity 11th edition Kotz Test Bank

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Chapter 01

1. A hypothesis is a _____.
   a. well-tested unifying principle that explains a body of facts
   b. set of experiments designed to test a theory
   c. tentative explanation or predication based upon experimental observations
   d. set of quantitative data
   e. concise statement of behavior that is always the same under the same conditions

ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.1 Chemistry and Its Methods
NOTES: Dynamic Question
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2. Which of the following statements concerning green chemistry is not correct?
   a. It is better to prevent waste than to treat or clean up waste after it is formed.
   b. Synthetic methods should be designed to use and generate substances that possess little or no toxicity to human health or the environment.
   c. Substances used in a chemical process should pose minimal risk for accidents.
   d. Raw materials should be renewable whenever technically and economically practical.
   e. Chemical syntheses should be done at extremely high temperatures to ensure harmful bacteria are destroyed.

ANSWER: e
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.2 Sustainability and Green Chemistry
DATE CREATED: 3/5/2014 6:30 PM
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3. One of the following is not a description of gases. Which one is it?
   a. particles far apart
   b. relatively high densities
   c. expands infinitely on heating
   d. fills any container completely
   e. easily compressed

ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.3 Classifying Matter
NOTES: Dynamic Question
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4. Which of the following statements concerning the kinetic-molecular theory of matter is/are CORRECT?
   1. Particles in a liquid vibrate back and forth about an average position.
   2. Particles in a solid are packed closely together, but are not confined to specific positions.
   3. Particles in a gas fly about randomly, colliding with themselves and the walls of their container.

   a. 1 only b. 2 only c. 3 only d. 1 and 2 e. 1, 2, and 3

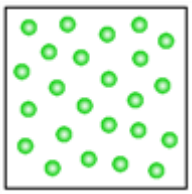
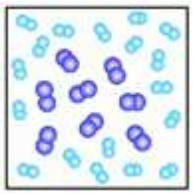
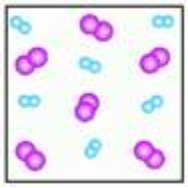
ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.3 Classifying Matter
DATE CREATED: 3/5/2014 6:30 PM
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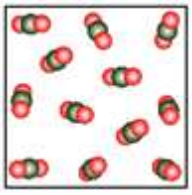
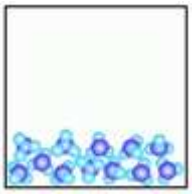
5. Which of the following statements concerning the kinetic-molecular theory of matter is/are correct?
   1. Particles in a gas move faster as the temperature increases.
   2. Particles in a liquid are packed closely together, but are not confined to specific positions.
   3. Particles in a gas vibrate back and forth about their average position.

   a. 1 only b. 2 only c. 3 only d. 1 and 2
   e. 1, 2, and 3

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.3 Classifying Matter
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Instructions: Use the pictures below to answer question 6:

A)  B)  C) 

D)  E) 

6. Which of the above figures represents a liquid compound?

   a. Figure A b. Figure B c. Figure C d. Figure D e. Figure E

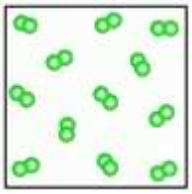
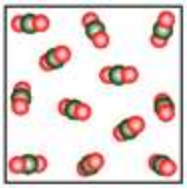
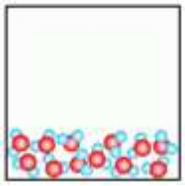
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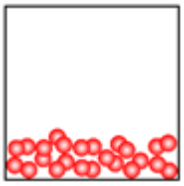
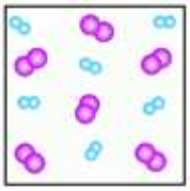
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Chapter 01

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
PREFACE NAME: Matching 1
TOPICS: 1.3 Classifying Matter
1.4 Elements
1.5 Compounds
NOTES: OWL | Dynamic Question
DATE CREATED: 3/5/2014 6:30 PM
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Instructions: Use the figures below to answer questions 7:

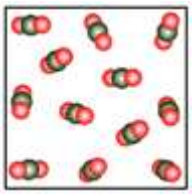
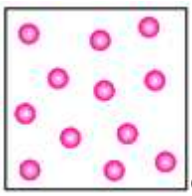
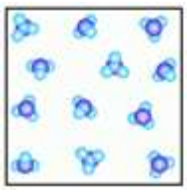
A)  **B)**  **C)** 

D)  **E)** 

7. Which of the above figures represents a homogeneous mixture?
a. Figure E b. Figure A c. Figure B d. Figure C
e. Figure D

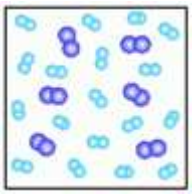
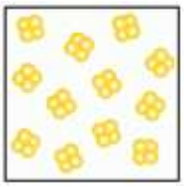
ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
PREFACE NAME: Matching 2
TOPICS: 1.3 Classifying Matter
1.4 Elements
1.5 Compounds
NOTES: OWL | Dynamic Question
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Instructions: Use the pictures below to answer question 8:

A)  B)  C) 

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D)  E) 

8. Which of the above figure represents a mixture of two elements?

a. Figure A b. Figure B c. Figure C d. Figure D e. Figure E

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
PREFACE NAME: Matching 3
TOPICS: 1.3 Classifying Matter
1.4 Elements
1.5 Compounds
NOTES: OWL
DATE CREATED: 3/5/2014 6:30 PM
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9. Which one of the following statements is correct?

a. A pure substance may be separated by filtration or distillation into two or more components.
b. A heterogeneous mixture is also known as a solution.
c. A heterogeneous mixture is composed of two or more substances in the same phase.
d. The composition is uniform throughout a homogeneous mixture.
e. The combination of a liquid and a solid always results in a heterogeneous mixture.

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.3 Classifying Matter
DATE CREATED: 3/5/2014 6:30 PM
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10. Which of the following is not a mixture?

a. soda
b. skim milk
c. wine
d. cow manure
e. graphite

ANSWER: e
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True

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TOPICS: 1.3 Classifying Matter
NOTES: Dynamic Question
DATE CREATED: 3/5/2014 6:30 PM
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11. Which of the following are likely to form a homogeneous mixture?
    1. milk and ice cream blended together with chocolate syrup
    2. an egg combined with milk and mixed with a whisk
    3. 1 gram table salt combined with 250 mL of water

    a. 1 only b. 2 only c. 3 only d. 1 and 2 e. 1, 2, and 3

ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.3 Classifying Matter
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12. Which one of the following is most likely to be a homogeneous mixture?
    a. plain yogurt
    b. blood
    c. gasoline
    d. campfire smoke
    e. mortar (a mixture of calcium carbonate and sand)

ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.3 Classifying Matter
NOTES: Dynamic Question
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13. Which of the following is a heterogeneous mixture?
    a. Vinegar (a mixture of acetic acid and water)
    b. Soil
    c. Sugar water
    d. Table salt dissolved in water
    e. Gasoline

ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.3 Classifying Matter
NOTES: Dynamic Question

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14. Which of the following statements is/are correct?
    1. Atoms are the smallest particles of an element; they retain the element's chemical properties.
    2. Substances composed of only one type of atom are classified as elements.
    3. Out of 118 known elements, only 48 elements occur naturally.

    a. 1 only b. 2 only c. 3 only d. 1 and 2
    e. 1, 2, and 3

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.4 Elements
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15. A number of the heaviest elements on the periodic table are named for famous scientists. Element number 99 was most likely named for which famous scientist?
    a. Glen Seaborg
    b. Marie Curie
    c. Alfred Nobel
    d. Albert Einstein
    e. Lise Meitner

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.4 Elements
A Closer Look
NOTES: Dynamic Question
DATE CREATED: 3/5/2014 6:30 PM
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16. What is the symbol for the element sulfur?
    a. S b. Po c. Po d. Po e. Po

ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.4 Elements
NOTES: Dynamic Question
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17. What is the correct symbol for potassium?
    a. P b. Pm c. K d. Pt e. Po
ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.4 Elements
DATE CREATED: 3/5/2014 6:30 PM
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18. What is the correct symbol for silver?
    a. S b. Si c. Ag d. Sr e. Au
ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.4 Elements
DATE CREATED: 3/5/2014 6:30 PM
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19. The element whose symbol is S is
    a. sulfur.
    b. cobalt.
    c. cobalt.
    d. cobalt.
    e. none of these.
ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.4 Elements
NOTES: Dynamic Question
DATE CREATED: 3/5/2014 6:30 PM
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20. What is the name of the element with the symbol B?
    a. barium
    b. beryllium
    c. bismuth
    d. boron
    e. bromine
ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice

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HAS VARIABLES: False
TOPICS: 1.4 Elements
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21. What is the name of the element with the symbol Cr?
    a. cerium
    b. carbon
    c. chromium
    d. cadmium
    e. chlorine

ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.4 Elements
DATE CREATED: 3/5/2014 6:30 PM
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22. Which one of the following substances is classified as a molecular element?
    a. I_2
    b. NO
    c. KCl
    d. $C_6H_{12}O_6$
    e. CO

ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.4 Elements
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23. Which of the following is <u>not</u> a correct name–symbol combination?
    a. scandium, Sc
    b. iron, Fe
    c. chlorine, Cl
    d. silicon, Si
    e. bromine, V

ANSWER: e
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True

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TOPICS: 1.4 Elements
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24. An electrically charged atom or group of atoms is a(n) _____.
    a. element
    b. ion
    c. molecule
    d. heterogeneous mixture
    e. solution

ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.5 Compounds
DATE CREATED: 3/5/2014 6:30 PM
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25. A pure substance composed of two or more different elements is a(n) _____.
    a. ion
    b. heterogeneous mixture
    c. chemical compound
    d. solid
    e. solution

ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.5 Compounds
DATE CREATED: 3/5/2014 6:30 PM
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26. A(n) _____ is a pure substance that is composed of only one type of atom.
    a. ion
    b. solution
    c. element
    d. molecule
    e. gas

ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.5 Compounds
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27. Which one of the following substances is classified as a chemical compound?
    a. Mo b. Nb c. Na d. NO e. Co

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.5 Compounds
NOTES: Dynamic Question
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28. Which of the following terms best describes methane, CH_4?
    a. Homogeneous mixture
    b. Ion
    c. Element
    d. Chemical compound
    e. Atom

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.5 Compounds
NOTES: Dynamic Question
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29. Which of the following statements concerning water (H_2O) is/are CORRECT?
    1. H_2O is a chemical compound.
    2. Water is a homogeneous mixture.
    3. Liquid water is a mixture of elemental hydrogen and oxygen.

    a. 1 only b. 2 only c. 3 only d. 1 and 2 e. 1, 2, and 3

ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.5 Compounds
DATE CREATED: 3/5/2014 6:30 PM
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30. Which one of the following statements is not a comparison of physical properties?
    a. Potassium reacts with water more quickly than calcium reacts with water.
    b. The electrical conductivity of aluminum is greater than copper.

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c. The density of copper is less than the density of lead.
d. The solubility of NaCl in hot water is greater than the solubility in cold water.
e. The boiling point of water is greater than the boiling point of ethanol.

ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.6 Properties and Changes
DATE CREATED: 3/5/2014 6:30 PM
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31. Which of the following statements is/are CORRECT?
1. The conduction of electricity through copper wire is a chemical change.
2. The rusting of iron is a chemical change.
3. The evaporation of ammonia at -33.3 °C is a chemical change.

a. 1 only b. 2 only c. 3 only d. 2 and 3 e. 1, 2, and 3

ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.6 Properties and Changes
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

32. Which one of the following statements is not a comparison of physical properties?
a. Mercury and gallium are both liquids at 50 °C.
b. Oxygen is more soluble in water than helium.
c. Silver and gold are malleable metals.
d. Oxygen and nitrogen are both liquids at -200 °C.
e. Calcium reacts more quickly than iron in acids.

ANSWER: e
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.6 Properties and Changes
DATE CREATED: 3/5/2014 6:30 PM
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33. An intensive property of a substance is
a. independent of the amount present.
b. dependent on its volume, but not its mass.
c. not affected by its temperature.
d. dependent only on its temperature.
e. dependent only on its mass and volume.

ANSWER: a

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POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.6 Properties and Changes
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34. Which of the following are extensive properties: mass, volume, and/or density?
    a. mass only
    b. volume only
    c. density only
    d. mass and volume
    e. volume and density

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.6 Properties and Changes
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35. All of the following are examples of intensive properties of matter except _____.
    a. thermal conductivity
    b. color
    c. malleability
    d. weight
    e. boiling point

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.6 Properties and Changes
NOTES: Dynamic Question
DATE CREATED: 3/5/2014 6:30 PM
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36. Which of following would be classified as a chemical change?
    a. the evaporation of water
    b. the condensation of nitrogen gas
    c. the melting of gold
    d. the rusting of iron
    e. the freezing of diesel fuel

ANSWER: d
POINTS: 1

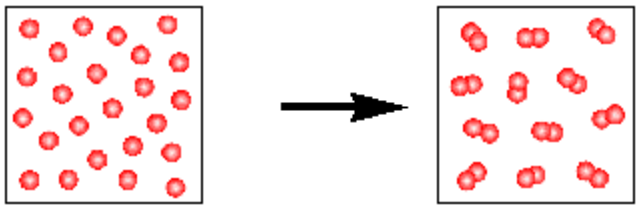
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Chapter 01

QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.6 Properties and Changes
NOTES: Dynamic Question
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37. What kind of change is depicted below?



a. physical change b. chemical change
c. both chemical and physical change d. no change

ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
TOPICS: 1.6 Properties and Changes
NOTES: OWL | Dynamic Question
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38. Which of the following observations is/are examples of chemical change?

1. Iron (Fe) rusts, forming Fe_2O_3.
2. The density of water increases when it changes from a solid to a liquid.
3. Sodium chloride melts at 801 °C.

a. 1 only b. 2 only c. 3 only d. 1 and 2 e. 2 and 3

ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.6 Properties and Changes
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39. Which of the following observations is/are examples of a physical change?

1. The density of water decreases when it solidifies.
2. Aluminum melts when heated above 660 °C.
3. Hydrogen peroxide (H_2O_2) decomposes to water and oxygen.

a. 1 only b. 2 only c. 3 only d. 1 and 2
e. 1, 2, and 3

ANSWER: d

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POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.6 Properties and Changes
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 1/29/2018 4:54 AM

40. A battery-operated power tool, such as a cordless drill, converts
    a. electrostatic energy to chemical potential energy.
    b. mechanical energy to electrostatic energy.
    c. thermal energy to mechanical energy.
    d. thermal energy to gravitational energy.
    e. chemical potential energy to mechanical energy.

ANSWER: e
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.7 Energy: Some Basic Principles
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

41. Which of the following lists contains only forms of kinetic energy?
    a. electrostatic, gravitational, and mechanical energy
    b. gravitational, mechanical, and electrical energy
    c. thermal, acoustic, and mechanical energy
    d. chemical, thermal, and acoustic energy
    e. gravitational, chemical, and electrostatic energy

ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.7 Energy: Some Basic Principles
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

42. Which of the following types of energy is/are classified as potential energy?
    1. Mechanical energy
    2. Chemical energy
    3. Electrostatic energy

    a. 1 only b. 2 only c. 3 only d. 2 and 3
    e. 1, 2, and 3

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True

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TOPICS: 1.7 Energy: Some Basic Principles
NOTES: Dynamic Question
DATE CREATED: 3/5/2014 6:30 PM
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43. Substances like hydrogen (H_2) and oxygen (O_2) that are composed of only one type of atom are classified as _____.
ANSWER: elements
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.4 Elements
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

44. Properties, such as color and density, which can be observed or measured without changing the composition of a substance are called _____ properties.
ANSWER: physical
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.6 Properties and Changes
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

45. A mass of 10 g of table salt dissolves in water to form a(n) _____ mixture (i.e., a mixture that is uniform throughout).
ANSWER: homogeneous
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.3 Classifying Matter
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

46. A(n) _____ is the smallest particle of an element that retains the characteristic chemical properties of that element.
ANSWER: atom
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.4 Elements

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DATE CREATED: 3/5/2014 6:30 PM
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47. The _____ of a substance is defined as its mass per unit volume.
ANSWER: density
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.6 Properties and Changes
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

48. Density is an example of a(n) _____ property and does not depend on the amount of a substance.
ANSWER: intensive
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.6 Properties and Changes
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 1/29/2018 5:01 AM

49. _____ energy is the energy associated with the separation of two electrical charges.
ANSWER: Electrostatic
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.7 Energy: Some Basic Principles
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

50. Potential energy possessed by water at the top of a waterfall is known as _____ energy.
ANSWER: gravitational
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.7 Energy: Some Basic Principles
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51. The law of _____ states that the total energy of the universe is constant.
ANSWER: conservation of energy

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POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.7 Energy: Some Basic Principles
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

52. Many regulators, environmentalists, and citizens around the world believe that _____ *development* is required to meet today's economic and environmental needs while preserving the options for future generations to meet theirs.
ANSWER: sustainable
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.2 Sustainability and Green Chemistry
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

53. To ensure integrity in science, experimental results should be _____ and reported in sufficient detail that the experiment can be repeated by others.
ANSWER: reproducible
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: False
STUDENT ENTRY MODE: Basic
TOPICS: 1.1 Chemistry and Its Methods
DATE CREATED: 3/5/2014 6:30 PM
DATE MODIFIED: 3/5/2014 6:30 PM

54. Which of the following statements is true of a chemical equation?
a. It is a representation of only a physical change rather than a chemical or molecular change.
b. It shows that the reactants on the left side of an equation produce the products on the right side of the equation.
c. The number of atoms found in the reactants doubles in the products.
d. The number of atoms found in the reactants halves in the products.
e. The identity of the substance in a chemical equation is preserved.
ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.6 Properties and Changes
DATE CREATED: 1/29/2018 5:03 AM
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55. Which of the following is an example of qualitative information about a substance?

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a. Color of the substance
b. Melting temperature of the substance
c. Mass of the substance
d. Volume of the substance
e. Boiling temperature of the substance

ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
TOPICS: 1.1 Chemistry and Its Methods
DATE CREATED: 1/29/2018 5:10 AM
DATE MODIFIED: 1/29/2018 5:11 AM

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Name:_____ Class:_____ Date:_____

Chapter 01

1. A hypothesis is a _____.
   a. well-tested unifying principle that explains a body of facts
   b. set of experiments designed to test a theory
   c. tentative explanation or predication based upon experimental observations
   d. set of quantitative data
   e. concise statement of behavior that is always the same under the same conditions

ANSWER: c

2. Which of the following statements concerning green chemistry is not correct?
   a. It is better to prevent waste than to treat or clean up waste after it is formed.
   b. Synthetic methods should be designed to use and generate substances that possess little or no toxicity to human health or the environment.
   c. Substances used in a chemical process should pose minimal risk for accidents.
   d. Raw materials should be renewable whenever technically and economically practical.
   e. Chemical syntheses should be done at extremely high temperatures to ensure harmful bacteria are destroyed.

ANSWER: e

3. One of the following is not a description of gases. Which one is it?
   a. particles far apart
   b. relatively high densities
   c. expands infinitely on heating
   d. fills any container completely
   e. easily compressed

ANSWER: b

4. Which of the following statements concerning the kinetic-molecular theory of matter is/are CORRECT?
   1. Particles in a liquid vibrate back and forth about an average position.
   2. Particles in a solid are packed closely together, but are not confined to specific positions.
   3. Particles in a gas fly about randomly, colliding with themselves and the walls of their container.

   a. 1 only b. 2 only c. 3 only d. 1 and 2 e. 1, 2, and 3

ANSWER: c

5. Which of the following statements concerning the kinetic-molecular theory of matter is/are correct?
   1. Particles in a gas move faster as the temperature increases.
   2. Particles in a liquid are packed closely together, but are not confined to specific positions.
   3. Particles in a gas vibrate back and forth about their average position.

   a. 1 only b. 2 only c. 3 only d. 1 and 2
   e. 1, 2, and 3

ANSWER: d

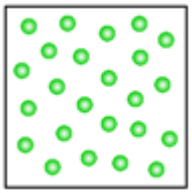
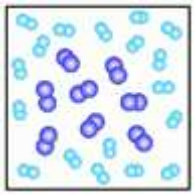
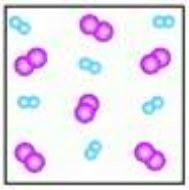
Instructions: Use the pictures below to answer question 6:

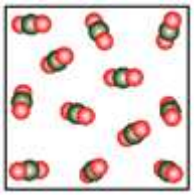
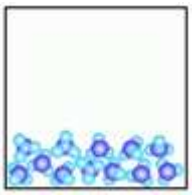
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Name:_____ Class:_____ Date:_____

Chapter 01

A)  B)  C) 

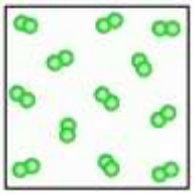
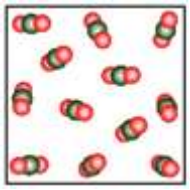
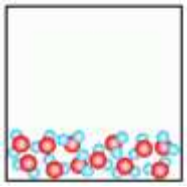
D)  E) 

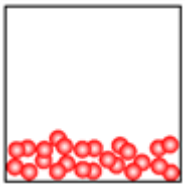
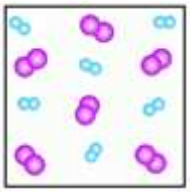
6. Which of the above figures represents a liquid compound?

a. Figure A b. Figure B c. Figure C d. Figure D e. Figure E

ANSWER: d

Instructions: Use the figures below to answer questions 7:

A)  **B)**  **C)** 

D)  **E)** 

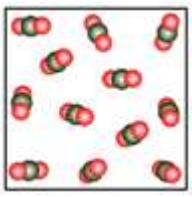
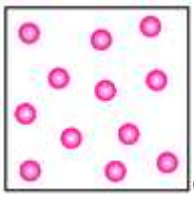
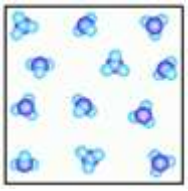
7. Which of the above figures represents a homogeneous mixture?

a. Figure E b. Figure A c. Figure B d. Figure C

e. Figure D

ANSWER: a

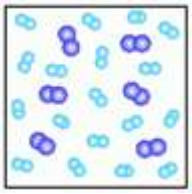
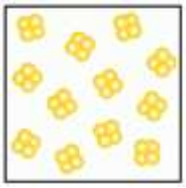
Instructions: Use the pictures below to answer question 8:

A)  B)  C) 

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D)  E) 

8. Which of the above figure represents a mixture of two elements?
   a. Figure A b. Figure B c. Figure C d. Figure D e. Figure E

ANSWER: d

9. Which one of the following statements is correct?
   a. A pure substance may be separated by filtration or distillation into two or more components.
   b. A heterogeneous mixture is also known as a solution.
   c. A heterogeneous mixture is composed of two or more substances in the same phase.
   d. The composition is uniform throughout a homogeneous mixture.
   e. The combination of a liquid and a solid always results in a heterogeneous mixture.

ANSWER: d

10. Which of the following is not a mixture?
   a. soda
   b. skim milk
   c. wine
   d. cow manure
   e. graphite

ANSWER: e

11. Which of the following are likely to form a homogeneous mixture?
   1. milk and ice cream blended together with chocolate syrup
   2. an egg combined with milk and mixed with a whisk
   3. 1 gram table salt combined with 250 mL of water

   a. 1 only b. 2 only c. 3 only d. 1 and 2 e. 1, 2, and 3

ANSWER: c

12. Which one of the following is most likely to be a homogeneous mixture?
   a. plain yogurt
   b. blood
   c. gasoline
   d. campfire smoke
   e. mortar (a mixture of calcium carbonate and sand)

ANSWER: c

13. Which of the following is a heterogeneous mixture?
   a. Vinegar (a mixture of acetic acid and water)
   b. Soil
   c. Sugar water

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d. Table salt dissolved in water

e. Gasoline

ANSWER: b

14. Which of the following statements is/are correct?

1. Atoms are the smallest particles of an element; they retain the element's chemical properties.
2. Substances composed of only one type of atom are classified as elements.
3. Out of 118 known elements, only 48 elements occur naturally.

a. 1 only b. 2 only c. 3 only d. 1 and 2

e. 1, 2, and 3

ANSWER: d

15. A number of the heaviest elements on the periodic table are named for famous scientists. Element number 99 was most likely named for which famous scientist?

a. Glen Seaborg

b. Marie Curie

c. Alfred Nobel

d. Albert Einstein

e. Lise Meitner

ANSWER: d

16. What is the symbol for the element sulfur?

a. S b. Po c. Po d. Po e. Po

ANSWER: a

17. What is the correct symbol for potassium?

a. P b. Pm c. K d. Pt e. Po

ANSWER: c

18. What is the correct symbol for silver?

a. S b. Si c. Ag d. Sr e. Au

ANSWER: c

19. The element whose symbol is S is

a. sulfur.

b. cobalt.

c. cobalt.

d. cobalt.

e. none of these.

ANSWER: a

20. What is the name of the element with the symbol B?

a. barium

b. beryllium

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c. bismuth
d. boron
e. bromine

ANSWER: d

21. What is the name of the element with the symbol Cr?
a. cerium
b. carbon
c. chromium
d. cadmium
e. chlorine

ANSWER: c

22. Which one of the following substances is classified as a molecular element?
a. I_2
b. NO
c. KCl
d. $C_6H_{12}O_6$
e. CO

ANSWER: a

23. Which of the following is not a correct name–symbol combination?

a. scandium, Sc
b. iron, Fe
c. chlorine, Cl
d. silicon, Si
e. bromine, V

ANSWER: e

24. An electrically charged atom or group of atoms is a(n) _____.
a. element
b. ion
c. molecule
d. heterogeneous mixture
e. solution

ANSWER: b

25. A pure substance composed of two or more different elements is a(n) _____.
a. ion
b. heterogeneous mixture
c. chemical compound
d. solid

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e. solution

ANSWER: c

26. A(n) _____ is a pure substance that is composed of only one type of atom.
    a. ion
    b. solution
    c. element
    d. molecule
    e. gas

ANSWER: c

27. Which one of the following substances is classified as a chemical compound?
    a. Mo b. Nb c. Na d. NO e. Co

ANSWER: d

28. Which of the following terms best describes methane, CH_4?
    a. Homogeneous mixture
    b. Ion
    c. Element
    d. Chemical compound
    e. Atom

ANSWER: d

29. Which of the following statements concerning water (H_2O) is/are CORRECT?
    1. H_2O is a chemical compound.
    2. Water is a homogeneous mixture.
    3. Liquid water is a mixture of elemental hydrogen and oxygen.

    a. 1 only b. 2 only c. 3 only d. 1 and 2 e. 1, 2, and 3

ANSWER: a

30. Which one of the following statements is not a comparison of physical properties?
    a. Potassium reacts with water more quickly than calcium reacts with water.
    b. The electrical conductivity of aluminum is greater than copper.
    c. The density of copper is less than the density of lead.
    d. The solubility of NaCl in hot water is greater than the solubility in cold water.
    e. The boiling point of water is greater than the boiling point of ethanol.

ANSWER: a

31. Which of the following statements is/are CORRECT?
    1. The conduction of electricity through copper wire is a chemical change.
    2. The rusting of iron is a chemical change.
    3. The evaporation of ammonia at -33.3 °C is a chemical change.

    a. 1 only b. 2 only c. 3 only d. 2 and 3 e. 1, 2, and 3

ANSWER: b

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32. Which one of the following statements is not a comparison of physical properties?
    a. Mercury and gallium are both liquids at 50 °C.
    b. Oxygen is more soluble in water than helium.
    c. Silver and gold are malleable metals.
    d. Oxygen and nitrogen are both liquids at -200 °C.
    e. Calcium reacts more quickly than iron in acids.

ANSWER: e

33. An intensive property of a substance is
    a. independent of the amount present.
    b. dependent on its volume, but not its mass.
    c. not affected by its temperature.
    d. dependent only on its temperature.
    e. dependent only on its mass and volume.

ANSWER: a

34. Which of the following are extensive properties: mass, volume, and/or density?
    a. mass only
    b. volume only
    c. density only
    d. mass and volume
    e. volume and density

ANSWER: d

35. All of the following are examples of intensive properties of matter except _____.
    a. thermal conductivity
    b. color
    c. malleability
    d. weight
    e. boiling point

ANSWER: d

36. Which of following would be classified as a chemical change?
    a. the evaporation of water
    b. the condensation of nitrogen gas
    c. the melting of gold
    d. the rusting of iron
    e. the freezing of diesel fuel

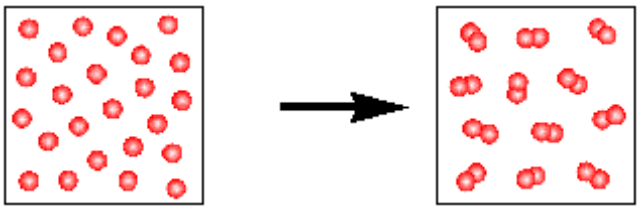
ANSWER: d

37. What kind of change is depicted below?

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a. physical change b. chemical change
c. both chemical and physical change d. no change

ANSWER: b

38. Which of the following observations is/are examples of chemical change?
1. Iron (Fe) rusts, forming Fe_2O_3.
2. The density of water increases when it changes from a solid to a liquid.
3. Sodium chloride melts at 801 °C.

a. 1 only b. 2 only c. 3 only d. 1 and 2 e. 2 and 3

ANSWER: a

39. Which of the following observations is/are examples of a physical change?
1. The density of water decreases when it solidifies.
2. Aluminum melts when heated above 660 °C.
3. Hydrogen peroxide (H_2O_2) decomposes to water and oxygen.

a. 1 only b. 2 only c. 3 only d. 1 and 2
e. 1, 2, and 3

ANSWER: d

40. A battery-operated power tool, such as a cordless drill, converts
a. electrostatic energy to chemical potential energy.
b. mechanical energy to electrostatic energy.
c. thermal energy to mechanical energy.
d. thermal energy to gravitational energy.
e. chemical potential energy to mechanical energy.

ANSWER: e

41. Which of the following lists contains only forms of kinetic energy?
a. electrostatic, gravitational, and mechanical energy
b. gravitational, mechanical, and electrical energy
c. thermal, acoustic, and mechanical energy
d. chemical, thermal, and acoustic energy
e. gravitational, chemical, and electrostatic energy

ANSWER: c

42. Which of the following types of energy is/are classified as potential energy?
1. Mechanical energy
2. Chemical energy
3. Electrostatic energy

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Chapter 01

a. 1 only b. 2 only c. 3 only d. 2 and 3
e. 1, 2, and 3
ANSWER: d

43. Substances like hydrogen (H_2) and oxygen (O_2) that are composed of only one type of atom are classified as _____.
ANSWER: elements

44. Properties, such as color and density, which can be observed or measured without changing the composition of a substance are called _____ properties.
ANSWER: physical

45. A mass of 10 g of table salt dissolves in water to form a(n) _____ mixture (i.e., a mixture that is uniform throughout).
ANSWER: homogeneous

46. A(n) _____ is the smallest particle of an element that retains the characteristic chemical properties of that element.
ANSWER: atom

47. The _____ of a substance is defined as its mass per unit volume.
ANSWER: density

48. Density is an example of a(n) _____ property and does not depend on the amount of a substance.
ANSWER: intensive

49. _____ energy is the energy associated with the separation of two electrical charges.
ANSWER: Electrostatic

50. Potential energy possessed by water at the top of a waterfall is known as _____ energy.
ANSWER: gravitational

51. The law of _____ states that the total energy of the universe is constant.
ANSWER: conservation of energy

52. Many regulators, environmentalists, and citizens around the world believe that _____ *development* is required to meet today's economic and environmental needs while preserving the options for future generations to meet theirs.
ANSWER: sustainable

53. To ensure integrity in science, experimental results should be _____ and reported in sufficient detail that the experiment can be repeated by others.
ANSWER: reproducible

54. Which of the following statements is true of a chemical equation?
a. It is a representation of only a physical change rather than a chemical or molecular change.
b. It shows that the reactants on the left side of an equation produce the products on the right side of the equation.
c. The number of atoms found in the reactants doubles in the products.
d. The number of atoms found in the reactants halves in the products.

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e. The identity of the substance in a chemical equation is preserved.

ANSWER: b

55. Which of the following is an example of qualitative information about a substance?

a. Color of the substance
b. Melting temperature of the substance
c. Mass of the substance
d. Volume of the substance
e. Boiling temperature of the substance

ANSWER: a

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