Introductory Chemistry 4th Edition Russo Test Bank
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Introduction to Chemistry, 4e **(Russo)**
Chapter 1 What Is Chemistry?

1.1 Multiple-Choice Questions

1) What is the name given to the element with the symbol "P"?
A) Polonium
B) Protactinium
C) Phosphorus
D) Palladium
Answer: C
Topic: Section 1.2

2) What is the name of the element whose symbol is "Co"?
A) Carbon
B) Chromium
C) Coal
D) Cobalt
Answer: D
Topic: Section 1.2

3) What is the name given to the element with the symbol "K"?
A) Kallium
B) Potassium
C) Phosphorus
D) Krypton
Answer: B
Topic: Section 1.2

4) What is the name given to the element with the symbol "As"?
A) silver
B) argon
C) antimony
D) arsenic
E) astatine
Answer: D
Topic: Section 1.2

5) By what chemical symbol do we know the element chromium?
A) Cr
B) Co
C) C
D) Cs
Answer: A
Topic: Section 1.2

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6) What chemical symbol has been given to the element sodium?
A) S
B) K
C) Na
D) Sr
Answer: C
Topic: Section 1.2

7) By what chemical symbol do we know the element magnesium?
A) Mn
B) Ma
C) M
D) Mg
Answer: D
Topic: Section 1.2

8) Which of the following is a pure, elemental substance?
A) $Br_{2(l)}$
B) $SO_{2(g)}$
C) $H_2O_{(l)}$
D) air
Answer: A
Topic: Section 1.2

9) Which of the following is a compound?
A) $F_{2(g)}$
B) $O_{2(g)}$
C) $Na_{(s)}$
D) $H_2O_{2(l)}$
Answer: D
Topic: Section 1.2

10) Which element pair is **incorrect**?
A) Au - gold
B) Pb - iron
C) Ag - silver
D) Hg - mercury
E) Mg - magnesium
Answer: B
Topic: Section 1.2

11) Which of the following represents a chemical change?
A) sugar dissolving into hot coffee
B) ice melting to form liquid water
C) water boiling to form steam
D) steel turning to rust in salt air
Answer: D
Topic: Section 1.4

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12) Which of the following represents a chemical change?
A) sublimation of dry ice
B) molding melted silver
C) frying an egg
D) breaking a piece of glass
Answer: C
Topic: Section 1.4

13) Which of the following represents a physical change only?
A) steel turning to rust in salt air
B) liquid water freezing into ice cubes
C) milk turning "sour"
D) wood burning to form ashes
Answer: B
Topic: Section 1.4

14) Which of the following represents a physical change only?
A) barbecuing a steak
B) adding electricity to water to produce hydrogen and oxygen gas
C) chopping a piece of wood
D) burning a propane camping stove
Answer: C
Topic: Section 1.4

15) A dilute sugar solution is an example of a(n) _____.
A) homogeneous mixture
B) heterogeneous mixture
C) compound
D) element
Answer: A
Topic: Section 1.3

16) Which of the following is an example of a homogenous mixture?
A) sand
B) copper
C) air
D) sugar
Answer: C
Topic: Section 1.2

17) Which of the following is an example of a heterogeneous mixture?
A) seawater
B) steel
C) milk
D) chicken noodle soup
Answer: D
Topic: Section 1.2

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18) What is another name for a homogeneous mixture?
A) pure substance
B) compound
C) solution
D) element
Answer: C
Topic: Section 1.2

19) Which of the following represents a chemical property of a specific metal?
A) It has magnetic properties.
B) It melts at 800 °C.
C) Its density is higher than that of water.
D) When in contact with air it corrodes.
Answer: D
Topic: Section 1.4

20) Which of the following may **not** be classified as matter?
A) tooth filling
B) sand
C) heat
D) seawater
Answer: C
Topic: Section 1.2

21) Which of the following represents a physical property?
A) Sodium metal is extremely reactive with chlorine gas.
B) Mercury is a shiny liquid at room temperature.
C) The tendency of aluminum to "oxidize"
D) The flammability of butane fuel.
E) The unreactive nature of argon gas
Answer: B
Topic: Section 1.3

22) The "disappearance" of mothballs is an example of _____.
A) melting
B) evaporation
C) condensation
D) sublimation
Answer: D
Topic: Section 1.3

23) The term used to describe the conversion from a gaseous state to a liquid state is _____.
A) melting
B) evaporation
C) condensation
D) sublimation
Answer: C
Topic: Section 1.3

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24) The term used to describe the conversion from a solid state to a gaseous state is _____.
A) melting
B) evaporation
C) condensation
D) sublimation
Answer: D
Topic: Section 1.3

25) What is the correct statement about an atom?
A) It is always pure.
B) It is the smallest particle of an element.
C) It is the smallest particle of a molecule.
D) It can be isolated.
Answer: B
Topic: Section 1.2

26) Which of the following is **not** a chemical property of carbon dioxide?
A) It is a critical component in photosynthesis.
B) It is used in fire extinguishers because it does not support combustion.
C) It is used to pump up bicycle tires.
D) It is soluble in blood.
Answer: C
Topic: Section 1.4

27) The only way one can change an element to another is via _____.
A) a chemical reaction
B) a physical reaction
C) a nuclear reaction
D) applying heat
Answer: C
Topic: Section 1.2

28) Which term best completes this definition?
An attempt to explain why a law exists is a(n) _____.
A) experiment
B) law
C) theory
D) model
Answer: C
Topic: Section 1.5

29) Which of the following can be classified as matter?
A) ice
B) sugar
C) graphite
D) All of the above are matter.
Answer: D
Topic: Section 1.2

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30) Which of the following is a pure substance?
A) blood
B) block of aluminum
C) air
D) orange juice
Answer: B
Topic: Section 1.2

31) Which of the following **cannot** be classified as matter?
A) air
B) temperature
C) fog
D) oxygen molecule
Answer: B
Topic: Section 1.2

1.2 True/False Questions

1) The earth, taken together as a unit, may be considered one very large piece of heterogeneous matter.
Answer: TRUE
Topic: Section 1.2

2) The smallest possible piece of gold which still retains all the properties of gold is a cube shape containing eight gold atoms.
Answer: FALSE
Topic: Section 1.2

3) Water is heterogeneous matter because it is made from twice as much hydrogen as oxygen (H_2O).
Answer: FALSE
Topic: Section 1.2

4) Iced tea, with sugar completely dissolved in it, is an example of homogeneous matter.
Answer: TRUE
Topic: Section 1.2

5) When milk goes "sour," only a physical change has occurred.
Answer: FALSE
Topic: Section 1.4

6) An atom is the smallest possible single piece of an element that still retains all the properties of that element.
Answer: TRUE
Topic: Section 1.2

7) The chemical compounds CO and CO_2 have exactly the same properties, because both are made from carbon and oxygen.
Answer: FALSE
Topic: Section 1.4

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8) It is scientifically proper to construct a theory without then doing any experiments to test it.
Answer: FALSE
Topic: Section 1.5

9) A theory summarizes facts in general statements.
Answer: FALSE
Topic: Section 1.5

10) A physical picture used to illustrate a theory is a model.
Answer: TRUE
Topic: Section 1.5

11) Air is a homogeneous mixture of nitrogen, oxygen and hydrogen.
Answer: FALSE
Topic: Section 1.2

12) Evaporated ethanol can be isolated by cooling, without changing its disinfectant properties.
Answer: TRUE
Topic: Section 1.3

13) Tap water is a homogeneous mixture, while freshly distilled water is a compound.
Answer: TRUE
Topic: Section 1.3

14) Cooking vegetables with steam is a chemical process.
Answer: TRUE
Topic: Section 1.2

15) If 1 gram of ice needs a certain amount of heat to melt, the same amount of energy must be removed to convert it back to ice at its melting point.
Answer: TRUE
Topic: Section 1.3

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1.3 Matching Questions

Match the event with the name of the process from the list below.

A) sublimation
B) evaporation
C) freezing
D) condensation
E) melting

1) The pond ices in winter.
Topic: Section 1.3

2) Mothballs disappear when placed between clothes.
Topic: Section 1.3

3) An ice cube disappears when left in a freezer for a year
Topic: Section 1.3

4) Water droplets form on the mirror of the medicine cabinet while taking a shower.
Topic: Section 1.3

5) While heating water in a tea kettle, part of it disappears.
Topic: Section 1.3

6) Ice cream liquefies on a hot day.
Topic: Section 1.3

7) The block of dry ice in an ice cream parlor starts smoking once the store attendant opens the ice cream freezer.
Topic: Section 1.3

8) Margarine is transformed into a liquid while frying an egg.
Topic: Section 1.3

9) Liquid nitrogen is transformed into a colorless gas.
Topic: Section 1.3

10) Water is collected in the gas tank of a car in a humid day.
Topic: Section 1.3

Answers: 1) C 2) A 3) A 4) D 5) B 6) E 7) A 8) E 9) B 10) D

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Match the substances with its classification from the list below.

A) compound
B) element
C) homogeneous mixture
D) heterogeneous mixture

11) Lemonade (without pulp)
Topic: Section 1.2

12) Fully rusted nail
Topic: Section 1.2

13) Distilled water
Topic: Section 1.2

14) Table salt
Topic: Section 1.2

15) Intravenous liquid
Topic: Section 1.2

16) Diamond
Topic: Section 1.2

17) Chlorine gas
Topic: Section 1.2

18) Air in a smog-free environment
Topic: Section 1.2

19) Oil-vinegar salad dressing
Topic: Section 1.2

20) Breakfast cereal
Topic: Section 1.2

21) Oxidized wine
Topic: Section 1.2

22) 24-karat golden bracelet
Topic: Section 1.2

23) 14-karat golden bracelet
Topic: Section 1.2

24) Gasoline
Topic: Section 1.2

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25) Sand
Topic: Section 1.2

26) Brass
Topic: Section 1.2

27) Steel
Topic: Section 1.2

28) Vitamin C tablet
Topic: Section 1.2

29) Contents of a helium balloon
Topic: Section 1.2

30) Golden nugget
Topic: Section 1.2

31) Graphite
Topic: Section 1.2

Answers: 11) C 12) A 13) A 14) A 15) C 16) B 17) B 18) C 19) D 20) D
21) C 22) B 23) C 24) C 25) A 26) C 27) C 28) A 29) B 30) B 31) B

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Match the event with the type of process involved from the list below.

A) physical process
B) chemical process

32) Mixing salt and water
Topic: Section 1.4

33) Iron rusting
Topic: Section 1.4

34) Paper burning
Topic: Section 1.4

35) Mixing ammonia and bleach
Topic: Section 1.4

36) Mothballs subliming
Topic: Section 1.4

37) Cooking of an egg
Topic: Section 1.4

38) Molding iron
Topic: Section 1.4

39) Diluting orange juice
Topic: Section 1.4

40) Digesting a sandwich
Topic: Section 1.4

41) Separating iron filings from sand with a magnet
Topic: Section 1.4

42) Using gasoline to drive a car
Topic: Section 1.4

43) Filtering a liquid to remove suspended material
Topic: Section 1.4

44) Molded cheese
Topic: Section 1.4

Answers: 32) A 33) B 34) B 35) B 36) A 37) B 38) A 39) A 40) B 41) A 42) B 43) A 44) B

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Match the element with the symbol from the list below.

A) Pu
B) Po
C) P
D) K
E) Pt
F) Pd
G) Pa

45) Potassium
Topic: Section 1.2

46) Polonium
Topic: Section 1.2

47) Phosphorus
Topic: Section 1.2

48) Plutonium
Topic: Section 1.2

49) Platinum
Topic: Section 1.2

50) Palladium
Topic: Section 1.2

51) Protactinium
Topic: Section 1.2

Answers: 45) D 46) B 47) C 48) A 49) E 50) F 51) G

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Match the element with the symbol from the list below.

A) N
B) No
C) Ne
D) Nd
E) Ni

52) Nitrogen
Topic: Section 1.2

53) Neodymium
Topic: Section 1.2

54) Nobelium
Topic: Section 1.2

55) Neon
Topic: Section 1.2

56) Nickel
Topic: Section 1.2

Answers: 52) A 53) D 54) B 55) C 56) E

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