CHEMISTRY UNIT REVIEW Answer Key

TEST DATE:

The following topics will be covered on the test:

- Physical and chemical properties
- Physical and chemical changes
- Changes of state
- Corrosion
- Parts of a firework
- Particle Theory
- Classifying matter (pure substances and mixtures, elements, compounds, solutions, and heterogeneous mixtures)
- Chemical symbols and formulas (counting atoms in a formula)
- Splint tests – identifying mystery gases
- Combining capacity (know what that means, and how elements combine)
- Atoms (know the subatomic particles too)
- Bohr-Rutherford diagrams
- Properties of metals, nonmetals, and metalloids
- Periodic table (know who invented the first one, how elements are arranged, trends)

Review Questions

A. Match the terms in the box to the definitions and sentences on the following page.

Ductility	Malleability	Oxygen
Solubility	Condensation	Combining capacity
Melting	Hydrogen	Freezing
Corrosion	Physical	Element
Mixture	Viscosity	Pure substance
Evaporation	Chemical	Solution
Heterogeneous mixture	Matter	Density
Atomic number	Carbon dioxide	Mass number
Compound	Sublimation	Proton
Electron	Neutron	Valence electrons

1. Change of state from solid to liquid _____Melting_____
2. Change of state from liquid to gas _____Evaporation_____
3. Change of state from liquid to solid _____Freezing_____
4. Change of state from gas to liquid _____Condensation_____
5. Change of state from solid to gas _____Sublimation_____
6. Ability of a metal to be bend without breaking, and to be hammered into thin sheets _____Malleability_____
7. Ability of a metal to be drawn into wires _____Ductility_____
8. Ability to dissolve in a solvent _____Solubility_____
9. How fast a liquid can flow _____Viscosity_____

10. Amount of matter in a certain volume _____Density_____
11. Anything that has mass and volume _____Matter_____
12. Slow chemical change that occurs when a metal reacts with oxygen to form an oxide. _____Corrosion_____
13. If a glowing splint is placed in a tube of gas and the splint ignites, then the gas is _____Oxygen_____
14. If a flaming splint is a placed in a tube of gas and pops, then the gas is _____Hydrogen_____
15. If a flaming splint is placed in a tube of gas and the flame goes out, then the gas is _____Carbon Dioxide_____
16. A substance made up of 2 or more different pure substances_____Mixture_____
17. A substance made up of only one type of particle _____Pure Substance_____
18. A pure substance that cannot be broken down into simpler substances ___Element_____
19. A mixture where you can see the individual parts _____Heterogeneous Mixture_____
20. A mixture where one substance dissolves in a different substance, and it looks the same throughout _____Solution_____
21. A pure substance that is made up of two or more different elements that are chemically bonded together. _____Compound_____
22. The number of connections an atom of an element can make. _____Combining Capacity_
23. The number at the top of each box on the periodic table. It represents the number of protons. _____Atomic Number_____
24. The number at the bottom of each box on the periodic table. It represents the number of protons plus the number of neutrons. _____Mass Number_____
25. A change that doesn't produce something new (change of state or form) __Physical___
26. A change that produces a new substance _____Chemical_____
27. A subatomic particle found in the nucleus with a charge of +1 and a mass of 1 _____Proton_____
28. A neutral subatomic particle found in the nucleus _____Neutron_____
29. A subatomic particle found orbiting the nucleus with a charge of –1 and a tiny mass _____Electron_____.
30. An element that has some properties like metals and some like nonmetals _____Metalloid_____.
31. Electrons in the largest outer orbit of an atom are called _____Valence Electrons___.

Name: _Answer Key_____ Date: _____

More Chemistry Review!

Test Format – 25 Multiple Choice and 58 Short Answer

A. Identify whether the following changes are chemical or physical. GIVE A REASON for your choice.

Remember:

Clues for a Physical Change (nothing new is formed) – change of shape or form, change of state, dissolving

Clues for a Chemical Change (something new is formed) – colour change, heat or light given off (heat is absorbed), bubbles of gas, precipitate forms, new smell.

a) A candle burns __Chemical Change_____
CLUE: Heat and light is given off, wick changed colour (white to black)

b) You twist a twist-tie around a bag of apples to close the bag. ___Physical_____
CLUE: Change of form

c) Apples turn brown and soft as they start to rot. __Chemical_____
CLUE: Colour change (white to brown)

d) Meat is taken out of the freezer to thaw. ___Physical_____
CLUE: Change of state

e) Two clear liquids are mixed. They turn cloudy because a solid has formed.
____Chemical_____
CLUE: Precipitate forms

B. Classify each of the following substances as an element, a compound, a solution or a mechanical mixture. In each case, explain the reason for your choice.

Substance:	Element, compound, solution or heterogeneous mixture?	Explanation:
Argon gas (Ar)	Element	Only one type of atom (only one capital letter)
Kool-aid juice crystals dissolved in water	Solution	Mixture where you can only see one part
Spaghetti sauce and meatballs	Heterogeneous Mixture	Mixture where you can see the different parts
Salt (NaCl)	Compound	More than one atom (more than one capital letter)

C. Fill out the following table describing subatomic particles.

Subatomic Particle	Charge	Mass	Location
Proton	1+	1 u	inside the nucleus
Neutron	Neutral (no charge)	1 u	inside the nucleus
Electron	1-	Almost zero	outside the nucleus

D. Use the periodic table to complete the table below.

Element Name	*Chemical Symbol*	*Atomic Number*	*Mass Number*	*Number of Protons*	*Number of Electrons*	*Number of Neutrons*
Potassium	K	19	39	19	19	39-19=20
Nitrogen	N	7	14	7	7	14-7=7
Silicon	Si	14	28	14	14	28-14=14
Phosphorus	P	15	31	15	15	31-15=16

E. Answer the following questions on a separate piece of paper.

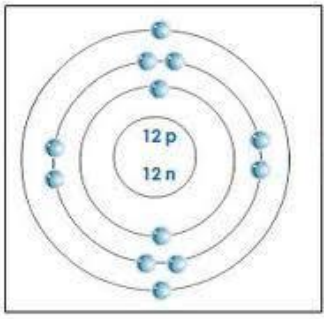
1. Describe the following physical properties of the surface of the desk you are using right now – state, colour, texture, odour, lustre, and clarity. Solid, beige, smooth, odourless, dull, opaque.
2. There are five clues that a chemical change has occurred. List them.
    - colour change
    - precipitate
    - bubbles of gas
    - heat or light is given off (heat is absorbed)
    - new smell
3. Sugar has the chemical formula $C_6H_{12}O_6$.
    a. Name the elements that are found in sugar. Carbon, Hydrogen, Oxygen
    b. How many atoms of each element are there in a molecule of sugar? Carbon-4, Hydrogen-12, Oxygen -6
    c. How many atoms in total are there in a molecule of sugar? total = 24
    d. Is sugar an element, compound, solution or heterogeneous mixture? Compound
    e. If you mixed sugar and water together, would you have an element, compound, solution, or heterogeneous mixture? Solution
4. List the four parts of a firework. fuel, source of oxygen (oxidizer), a fuse (heat source), colour producer.
5. Aluminum has a combining capacity of 3 and oxygen has a combining capacity of 2.
    a. What is the chemical formula of the compound that forms when carbon and fluorine combine? HINT: Remember to criss-cross. Al_2O_3
    b. What is the name of the compound? aluminum oxide

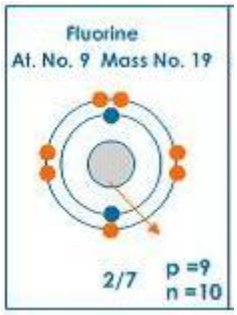
6. Calculate the number of protons, neutrons, and electrons for each element below, and then draw its Bohr-Rutherford diagram.

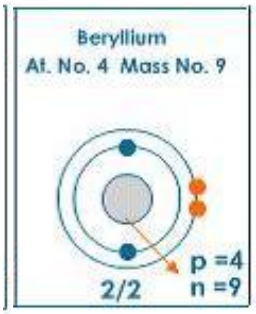
a. Magnesium
p 12
e 12
n 24-12=12

b. Fluorine
p 9
e 9
n 19-9=10

c. Beryllium
p 4
e 4
n 9-4=5







7. What are the points of the particle theory?

1. All matter is made up of tiny particles
2. All particles of one substance are the same. Different substances are made up of different particles
3. The particles are always moving. The more energy they have, the faster they move
4. There are attractive forces between the particles. These forces are stronger when the particles are closer together.

8. Name four differences between metals and nonmetals.

Metals	Nonmetals
lustrous	dull
conduct electricity	do not conduct electricity
malleable	brittle
solid at room temperature	solid, liquid and gas at room temperature