

Test Date is: _____

Topics on this Test

- Elements
- The Periodic Table of Elements
 - Parts of the Periodic Table
 - Families and Properties of Families
- Molecules and Compounds
 - Structure- Chemical Formula and Illustrations
- Atoms
 - Structure: Nucleus, Proton, Neutron, Electrons
 - How atoms bond with each other
- Physical and chemical properties of matter
- Evidence that a chemical reaction has occurred
- Physical and Chemical Properties of a substance before and after a chemical reaction
- Reactants and products in a chemical equation
- Laws of Conservation of Matter and Mass
- Acids, Bases and pH Scale

Be able to answer all of the questions in each Study Section below.

Study Section 1: Elements and the Periodic Table

1. What is an element?
Smallest unit that still retains individual properties
2. How are the elements in the Periodic Table arranged?
by atomic number (number of protons)
3. What are the 4 classifications in the Periodic Table that we talked about, from left to right?
Highly Reactive Metals, Least Reactive Metals, Highly Reactive Nonmetals, Least Reactive Nonmetals (Noble Gases)
4. What kind of elements are on the left of the "jagged line," and what kind of elements are on the right?
metals / nonmetals
5. Vertical columns in the Periodic Table are called families.
6. Elements in the same family share similar properties.

Study Section 2: Molecules and Compounds

1. A molecule is

When two or atoms Chemically Combine.

2. A compound is

When two or more different atoms Chemically Combine.

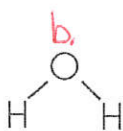
3. Atoms bond with each other to form molecules by sharing or transferring one or more electrons.

4. Which of the following molecules are also compounds? (circle all that apply)

N_2 , H_2 , NH_3 , C_{12} , CO_2 , H_2O_2 , O_2 , H_2SO_4

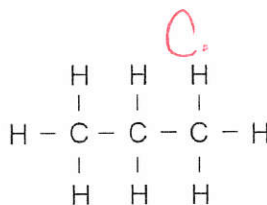
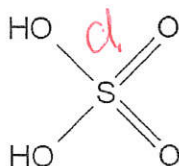
5. Match each molecule to its molecular formula below:

a. CO_2



b. H_2O

c. C_3H_8



d. H_2SO_4

Study Section 3: Atoms

1. An atom is

smallest part of an element that retains property of element

2. The building blocks of matter are atoms.

3. Every atom has one nucleus at its center.

4. Within the nucleus are the protons and neutrons.

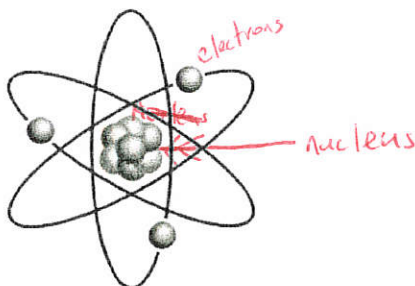
5. The protons have a positive charge.

6. The neutrons have a neutral or no charge charge.

7. Electrons spin around the nucleus.

8. Electrons have a negative charge.

9. Label the atom below.



Study Section 4: Physical and Chemical Properties of and Changes in Matter

1. A physical property is

Characteristic of physical change

2. A chemical property is

Characteristic of chemical change

3. Label each of the following properties as Physical (P) or Chemical (C):

- P color
- C flammability
- P shape
- P mass
- C reactivity
- P pH
- P state of matter (solid, liquid, gas)
- P boiling point (or melting point)

4. Label each of the following changes in matter as a Physical Change (P) or a Chemical Change (C):

- C burning a marshmallow and it turns black
- P painting your nails with polish
- C cooking an egg in a frying pan
- P cutting the grass
- P sanding a block of wood
- C acid rain destroying a marble statue
- C steel wool rusting and turning brown
- P boiling a pot of water on the stove
- P evaporation of rubbing alcohol from your skin

5. When sulfuric acid is poured on a sponge (cellulose- $C_6H_{10}O_5$) a chemical reaction occurs. List physical and chemical properties of each substance before the reaction occurred and properties of the substance after.

a. Before:

i. sponge- porous, solid, and

ii. acid- liquid, low pH, clear

b. After: Black, ~~thick~~ thick liquid

Study Section 5: Chemical Reactions

1. List 5 pieces of EVIDENCE that a chemical change has occurred:

- c. Color change
- d. precipitate formed
- e. temperature change
- f. gas production
- g. explosion

6. Look at the properties before and after. Has a chemical change occurred?

yes / no

Properties Before	Properties After
grey-black	black
powdered solid	gas and ash
	bright light and loud sound produced

7. Look at the properties before and after. Has a chemical change occurred?

yes / no

Properties Before	Properties After
brown, shiny metal	brown, shiny metal
malleable and ductile	malleable and ductile
straight wire	curved into coils

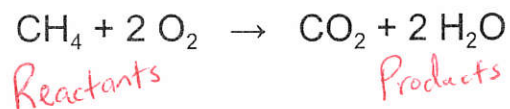
8. In a chemical equation, the reactants are

what is put into a chemical reaction

9. In a chemical equation, the products are

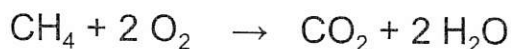
what is produced by a chemical reaction

10. In the equation below, label the reactants and the products.



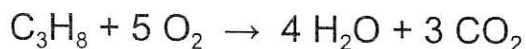
Study Section 6: Law of Conservation of Matter and Mass

1. The Law of Conservation of Matter says that in a chemical reaction,
Cannot create or destroy matter.
2. The Law of Conservation of Mass says that in a chemical reaction,
Cannot create or destroy mass.
3. The point to remember is that in a chemical reaction, what you start with is
what you end with.
4. In a chemical reaction, atoms are not created or destroyed, they are just
rearranged or moved.
5. Tell the number of each type of atom in the equation below.



LEFT: C 1 H 4 O 4 → RIGHT: C 1 H 4 O 4

6. Tell the number of each type of atom in the equation below.



LEFT: C 3 H 8 O 10 → RIGHT: C 3 H 8 O 10

7. Which of the compounds below could be a product for the reactants: $2 \text{Hg} + \text{O}_2$

How do you know? Same elements + same number of atoms

- a. $3 \text{Hg}_2\text{O}_6$
 - b. H_2SO_4
 - c. 2HgO
 - d. HgCl_3
8. Which of the pairs of compounds below could be the reactants for the product:

2SO_3 How do you know? Same elements + same number of atoms

- a. $\text{CO}_2 + \text{H}_2\text{O}$
- b. $2 \text{SO}_2 + \text{O}_2$
- c. $\text{H}_2\text{O} + \text{SO}_4$
- d. $\text{NaCl} + \text{O}_2$

Study Section 7: Acids, Bases and the pH Scale

- The pH scale measures how acidic or basic a solution is.
- The pH scale goes from 0 to 14.
- Substances with a pH of ~~0-7~~ 7-0 are acids.
- Substances with a pH of 7-14 are basic.
- A pH of 7 is called neutral.
- Distilled Water has a pH of 7 and is neutral.
- Some common acids and their pH values:
 - Battery Acid 1
 - Vinegar 3
- Some common bases and their pH values:
 - Baking Soda 8
 - Bleach 12
- Which of the following is the strongest acid?
 - Substance A (pH = 5.6)
 - Substance B (pH = 7.8)
 - Substance C (pH = 2.5)
- Which of the following is the strongest base?
 - Substance A (pH = 10.9)
 - Substance B (pH = 13)
 - Substance C (pH = 8)
- ~~An acid reacting with a base forms a salt.~~
- To "neutralize" a base, react it with a(n) acid.
- T / F Only acids can hurt you.