

Topic 1 Worksheet: Organization of Matter

1. Why is it more important to have a characteristic property rather than a non-characteristic one?

A characteristic property is unique to a particular substance; only one substance can have that exact property

Non-characteristics properties are shared by many different substances so it doesn't necessarily identify the substance

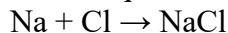
2. What is the difference between a compound and an element? Are they pure substances or mixtures?

Both are pure substances

Element: only one type of atom

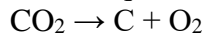
Compound: at least 2 different types of atoms that are chemically combined

3. Answer the questions regarding the following chemical reaction:



- A) What is this type of chemical reaction called? synthesis
- B) How does the mass of NaCl compare to the mass of Na? it is larger
- C) Na is an example of what type of substance? element/atom
- D) NaCl is an example of what type of substance? molecule/compound

4. Answer the questions regarding the following chemical reaction:



What type of chemical reaction is this? decomposition

5. For each example indicate whether there is a chemical or physical change occurring.

	Chemical change	Physical change
a person making "clouds" with their breath on a cold day		P
a cut apple turning brown	C	
a person digesting a meal	C	
a crumpled piece of paper		P
a person cleaning a grease spot with soap		P
a person producing a compound NaCl	C	
limewater that becomes milky when exposed to carbon dioxide	C	
A person chewing a piece of steak		P

Multiple Choice Section

6. Looking at the following reaction: $\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$
What type of chemical reaction is represented and how will the mass change?

- A) It is a synthesis reaction and the mass increases
- B) It is a synthesis reaction and the mass decreases
- C) It is a decomposition reaction and the mass increases
- D) It is a decomposition reaction and the mass decreases

7. Which of the following are not examples of characteristic properties?

- 1- Iron's density is 6.5 g/cm^3
- 2- Water's boiling point is $100 \text{ }^\circ\text{C}$
- 3- The mass of zinc is 65 g
- 4- Water turned cobalt chloride paper pink
- 5- Zinc's temperature is $33 \text{ }^\circ\text{C}$
- 6- Aluminium is silver in colour

- A) 1, 4 and 5
- B) 1, 2 and 3
- C) 1, 2 and 4
- D) 3, 5 and 6

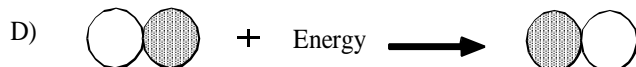
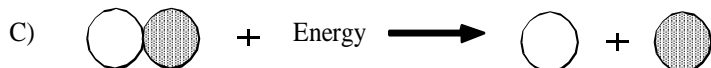
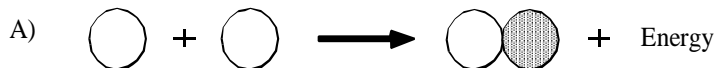
8. Louis found five unmarked bottles in a workroom. Each of the bottles contained a pure substance. He noted the following properties for each of these colourless liquids :

- 1) boiling point
- 2) mass
- 3) volume
- 4) density

Which properties does Louis need to know to identify these liquids?

- A) 1 and 2
- B) 1 and 3
- C) 2 and 4
- D) 1 and 4

9. Which of the following illustrates a decomposition reaction?



10. After heating the red powder at high temperature, you obtain a liquid and a gas. Your teacher says the gas formed is oxygen. From these results was the original powder an element or a compound and what test could be administered to verify whether or teacher was right or not?

- A) The powder was an element and the glowing splint test should cause a popping sound
- B) The powder was an element and the flaming splint test should cause the splint to re-light
- C) The powder was a compound and the glowing splint test should cause the splint to re-light
- D) The powder was a compound and the flaming splint test should cause a popping sound

11. The following statements indicate possible reactions that occur during a chemical change:

- 1- The mass decreased
- 2- The mass increased
- 3- A purple gas was formed
- 4- A colorless liquid was produced
- 5- A grey liquid and colorless gas was produced

Which of them indicate the substance was originally a compound?

- A) 1 and 5
- B) 2 and 5
- C) 2 and 4
- D) 1 and 3

12. In the laboratory, a student made the following observations about an unknown gaseous substance that was to be identified.

Observations	Result
Colour	Colourless
Odour	Odourless
Mass	0.16 g
Volume	128 mL
Burning splint test	No reaction
Glowing splint test	No reaction
Limewater test	No reaction

The student was also given a table with the following information :

Vade-mecum						
Gas	Observation					
	Colour	Odour	Density (g/mL)	Burning Splint Test	Glowing Splint Test	Limewater Test
Nitrogen gas	Colourless	Odourless	0.00125	No reaction	No reaction	No reaction
Hydrogen gas	Colourless	Odourless	0.00009	Popping Sound	No reaction	No reaction
Carbon dioxide	Colourless	Odourless	0.00198	No reaction	No reaction	Becomes cloudy
Helium	Colourless	Odourless	0.0018	No reaction	No reaction	No reaction

Using all the information, identify the unknown gas.