

# CHAPTER 1: INTRODUCTION TO CHEMISTRY

Chemistry – the study of composition of matter and the changes the matter undergoes.

## 5 main branches of Chemistry:

- **Organic chemistry** – the study of things containing carbon
- **Inorganic chemistry** – opposite of organic chem.
- **Biochemistry** – the study of living things.
- **Analytical chemistry** – the study of matter composition.
- **Physical chemistry** – the study of mechanism, rate, and energy.

## Important of Chemistry

### Did you know?

Chemistry is Life

Chemistry...it is not just for chemists

Take a good look at the thing around you. What do you see?

Think about your personal and school things?

What have you eaten this breakfast?

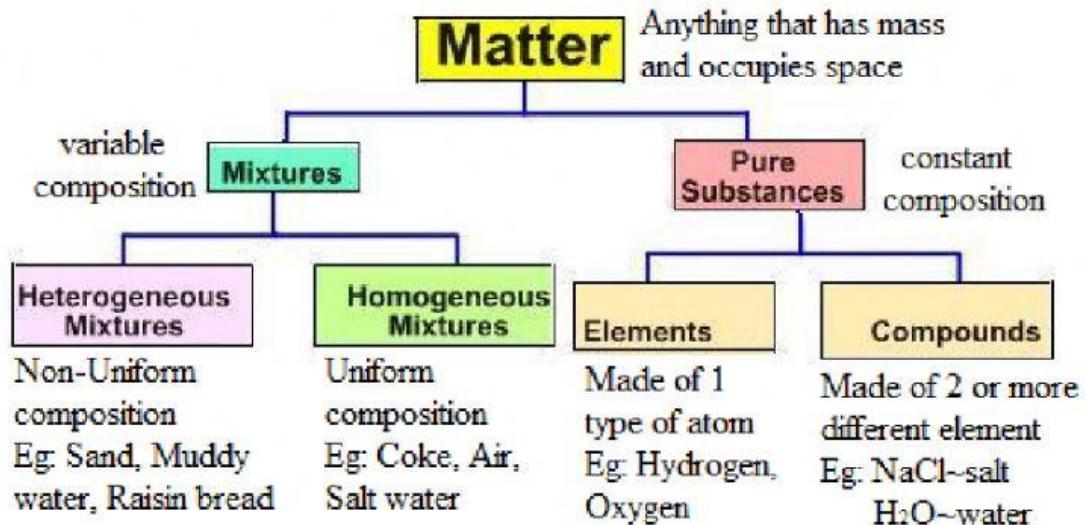
These and more are products of chemistry.

Chemistry is all around us and is involved in everything we need,  
Do and interact with in our everyday lives!



Now, can you list the impacts of chemistry in our everyday live?

## Basic Fundamental Concepts in Chemistry



Answer each of the questions below.

1. Chemistry is the study of
  - a. living systems
  - b. the stars and planets
  - c. all matter
  - d. reactions in a test tube
2. All of the following are characteristics of matter except
  - a. matter can disappear and reappear
  - b. matter has mass
  - c. matter occupies space
  - d. all things are composed of matter
3. Which of the following is not a chemistry topic?
  - a. the composition of ocean water
  - b. what ocean fish eat
  - c. the height of waves in surf
  - d. what a surf board is made of
4. An analytical chemist is involved with
  - a. studies of what penguins eat
  - b. research to develop new rocket fuels
  - c. the synthesis of new carbon compounds
  - d. measurement of the amount of minerals in cereals
5. Making new compounds for high-speed tires is best done by the
  - a. physical chemist
  - b. organic chemist
  - c. inorganic chemist
  - d. biochemist
6. If you love carbon, which branch of science should you plan on studying?
  - a. physical
  - b. inorganic
  - c. analytical
  - d. organic
7. Which of the following is not matter?
  - a. Air
  - b. Skin
  - c. Water
  - d. Energy
8. Which is the best definition of chemistry?
  - a. The study of the contents of matter and its chemical properties.
  - b. The study of chemical reactions in elements.
  - c. The study of the contents of molecules.
  - d. The study of ions and atoms
9. Carbon, hydrogen and oxygen are all examples of:
  - a. cells
  - b. subatomic particles
  - c. elements
  - d. molecules
10. The basic unit of matter is called a(n):
  - a. atom
  - b. cell
  - c. element
  - d. electron

# Physical and Chemical Properties

## Physical

- Observed with senses
- Determined without changing matter

### See



Gold is shiny

### Hear



Metal is sonorous

### Feel

Rubber bends



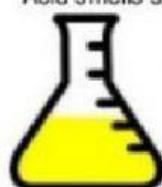
### Touch

The ceramic pot is hard



### Smell

Acid smells sour



### Measure

The temperature is high



## Chemical

- Indicates how substance reacts with something else
- Matter will be changed into a new substance after the reaction



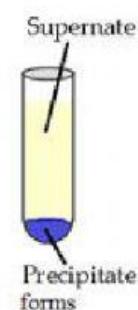
reactivity



Combustibility/flammability



oxidation



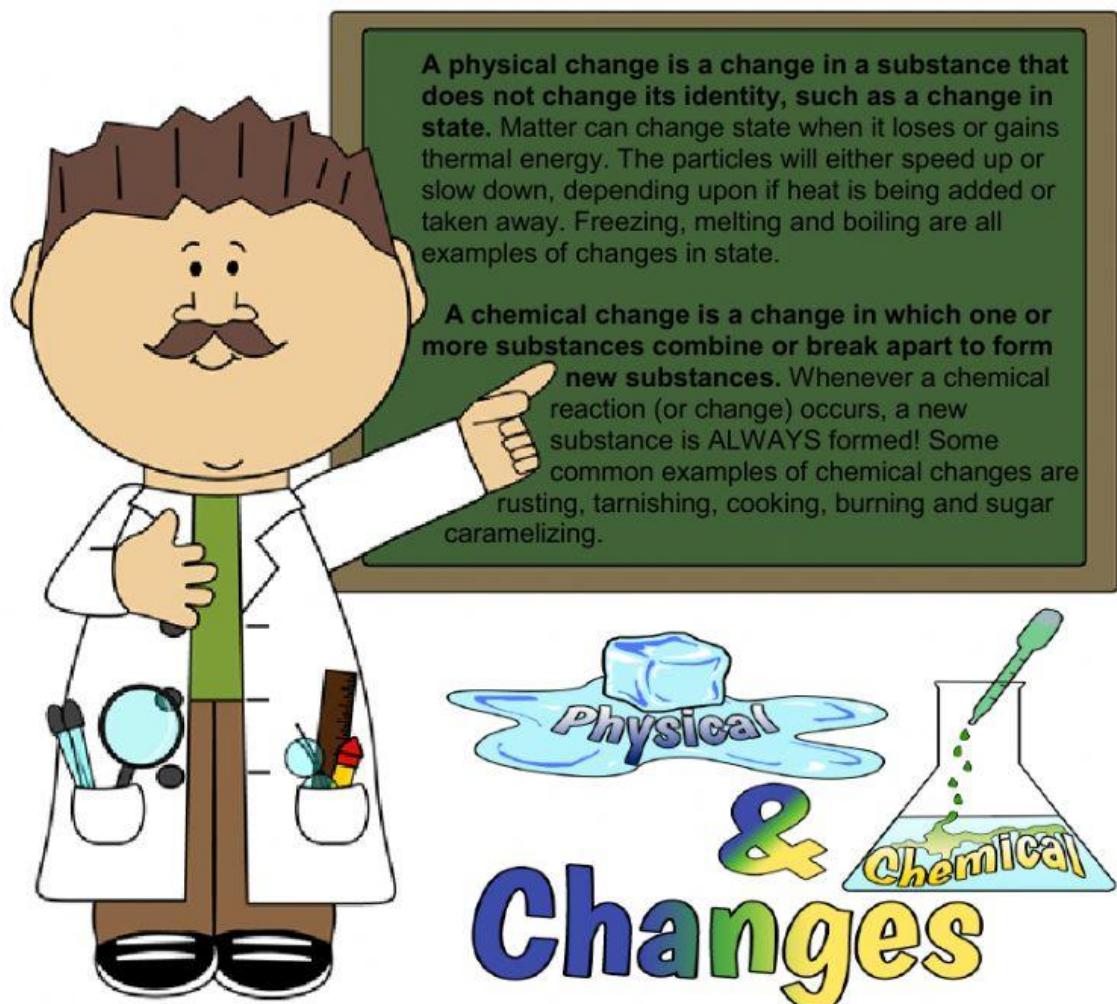
Supernate

Precipitate forms

State whether each of the following is a physical or a chemical property.

	Description	Physical/Chemical
1.	The sulphur is yellow.	_____
2.	Iron reacts with sulphur to give heat and a flame.	_____
3.	Baking soda with acid produces bubbles of gas.	_____
4.	Metal can be rolled into flat sheets.	_____
5.	Oxygen is colorless, odorless and tasteless.	_____
6.	Nitrogen dioxide gas has a choking smell.	_____
7.	Helium is less dense than air, so a helium balloon floats.	_____
8.	Wax candle burns in oxygen	_____
9.	An apple rots due to fungi.	_____
10.	Mercury metal is a liquid.	_____
11.	Iodine gas is purple.	_____
12.	Hydrofluoric acid is poisonous.	_____
13.	Gold is shiny metal.	_____
14.	Cesium is the only other gold-colored metal.	_____
15.	Potassium burns with a purple flame to make a white powder.	_____
16.	Copper nitrate is a blue crystal.	_____
17.	Two colorless solutions mix to give a yellow solid precipitate.	_____
18.	Copper can be stretched into a thin wire.	_____
19.	Copper metal reacts with nitric acid to make a brown gas.	_____
20.	Salt, sodium chloride, is a white crystal that melts at 801°C.	_____

# Physical and Chemical Changes



Identify which examples are **physical (P)** or **chemical (C)** changes.

1. A pencil breaking in half. \_\_\_\_\_
2. Iron turning (oxidizing) into rust. \_\_\_\_\_
3. Burning firewood to make carbon and heat. \_\_\_\_\_
4. Cutting logs to make firewood. \_\_\_\_\_
5. Mining bauxite from the ground. \_\_\_\_\_
6. Making aluminum from bauxite. \_\_\_\_\_

7. Falling leaves from a tree. \_\_\_\_\_
8. Composting leaves into soil. \_\_\_\_\_
9. The rain turned to snow. \_\_\_\_\_
10. Broke a glass on the bathroom floor. \_\_\_\_\_
11. Frying three eggs for breakfast. \_\_\_\_\_
12. An important paper caught on fire at the lab. \_\_\_\_\_
13. The bread in refrigerator got moldy. \_\_\_\_\_
14. Crushing a soda can. \_\_\_\_\_
15. Slicing bread. \_\_\_\_\_
16. Exploding fireworks. \_\_\_\_\_
17. Digesting food. \_\_\_\_\_
18. Melting butter. \_\_\_\_\_
19. Bending a paper clip. \_\_\_\_\_
20. Folding clothes. \_\_\_\_\_