

UNIT 1 : LESSON 3

Distinguishing between materials by their properties...

First: physical properties

Second: Chemical properties

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Physical Properties:-

Properties of matter that can be observed and some of which can be measured

Physical properties: -

- 1- Viscosity
- 2- Density
- 3- Color, taste and smell
- 4- Solubility in water
- 5- Boiling point
- 6- Melting point
- 7- Hardness degree
- 8- Electrical conductivity
- 9- Thermal conductivity

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1) Viscosity:-

A property of fluids that expresses the extent of their resistance to flow and the movement of objects through them

The viscosity of water is less than the viscosity of water



2) Density:-

A physical property used to distinguish between substances that float on the surface of water or sink in it

Materials whose density is less than the density of water float on the surface, such as (wood - plastic - cork).

Materials whose density is greater than the density of water sink, such as (iron, nail, coin).



3) Melting point:-

The temperature at which a substance begins to transform from the solid state to the liquid state

Compare the melting point of a Bar of butter and a Piece of airtel.

The Bar of butter melts easily, while the airtel is not affected even by extremely high temperatures.



Airgel :-

Transparent, low-density material that contains 99.8% air.

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Second: Chemical properties:-

Properties of a substance that only appear when a chemical reaction occurs and leads to a change in the form and composition of the substance

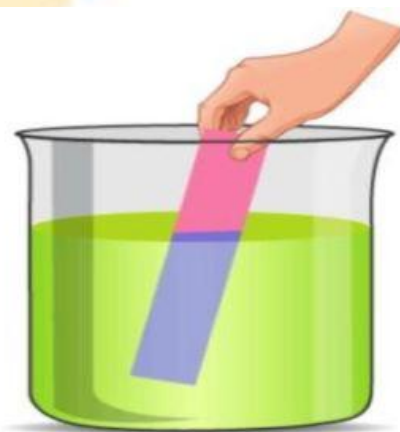
1) The color of the sunflower leaf changes depending on the type of material

(Acidic substances change color to red) (Alkaline substances change color to blue) (Neutral substances do not change color)



Acid

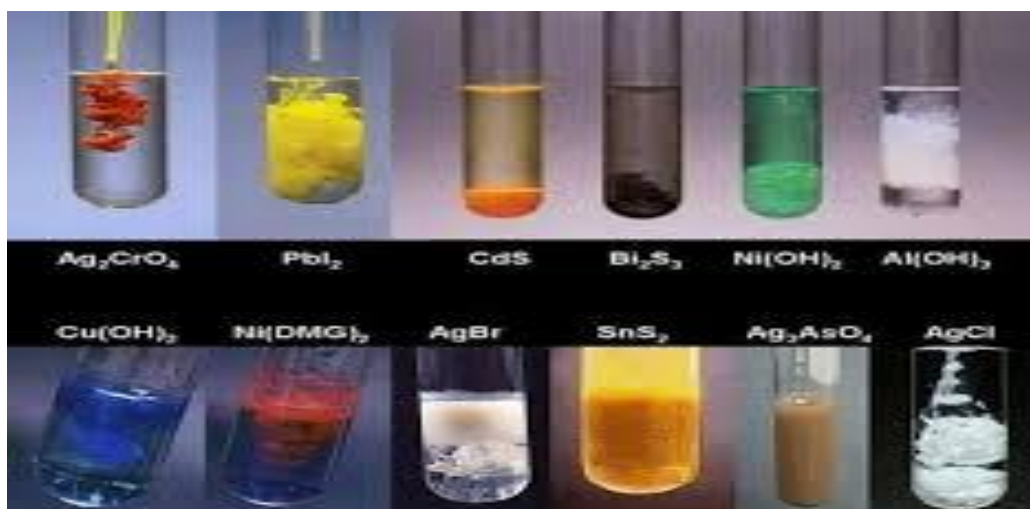
Blue litmus turns red



Base

Red litmus turns blue

2) A colored precipitate is formed depending on the type of reagent used (reagents can be used to distinguish between transparent solutions, so that when the reagent is placed in each solution, a precipitate of a different color is produced).



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Use materials according to their properties

Helium:-

Helium is used to fill the balloon until it rises higher ?

because its density is less than the density of air and is not flammable.



Nitrogen:-

Nitrogen is used to fill car tires instead of air ?

because it is not affected by temperature and does not react with rubber



Stainless steel alloy:-

It is used in the manufacture of cooking utensils ?

because it is characterized by its resistance to rust



Aluminum and titanium alloy:-

It is used in the manufacture of military aircraft structures?

because it is lighter than using only aluminum and maintains its durability at high temperatures.



Exercises : Complete the previous sentences:-

- 1- ----- and ----- are an example of physical properties
- 2- Viscosity of water ----- Viscosity of honey
- 3- ----- and ----- of materials that float on the surface of water
- 4- ----- and ----- of materials that sink under the surface of the water
- 5- ----- It is the degree at which a substance changes from a solid state to a liquid state
- 6- It is not affected by ----- high temperature
- 7- The percentage of air in the ergol is -----
- 8- The chemical properties can be seen during -----
- 9- The acidic substance changes the color of litmus paper to -----
- 10- ----- can be used to distinguish between transparent solutions
- 11- Helium density ----- than air density
- 12- Gases that do not interact with the tire and can be filled with it -----
- 13- Alloy ----- that resists rust
- 14- Aluminum and titanium alloy are used in -----
- 15- Alloy ----- is used in the manufacture of cooking utensils