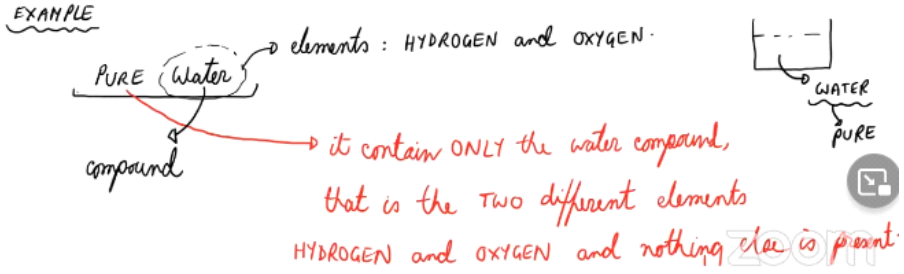
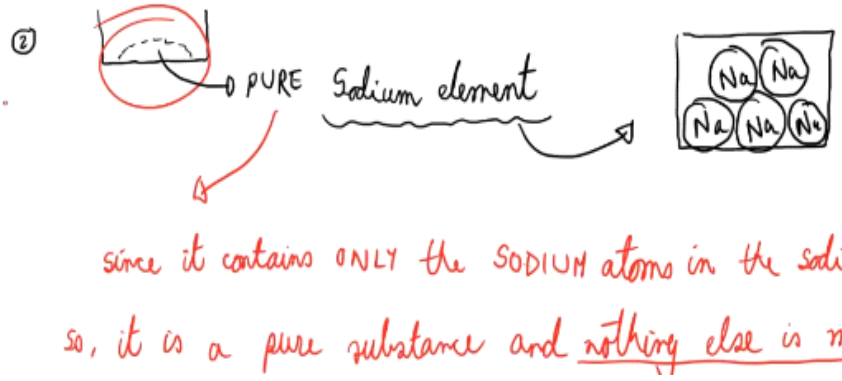
BASIC CONCEPTS 2

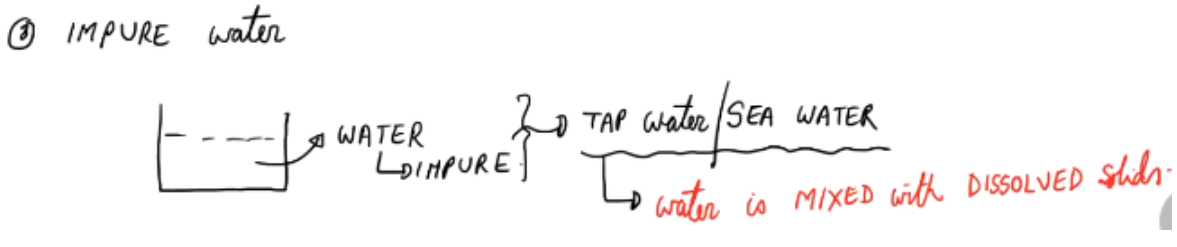
Pure Substance is a substance which is said to be pure when it ONLY the substance and nothing else.

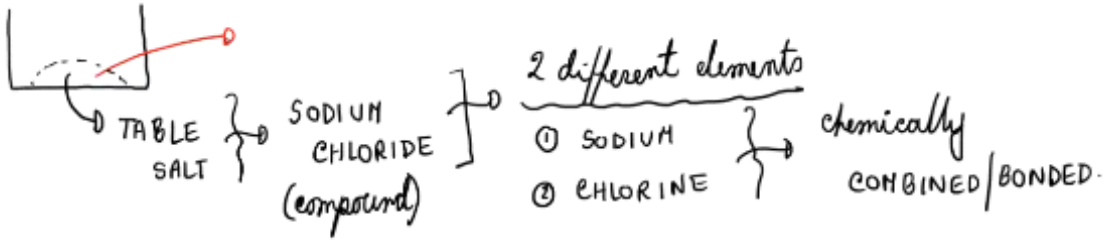


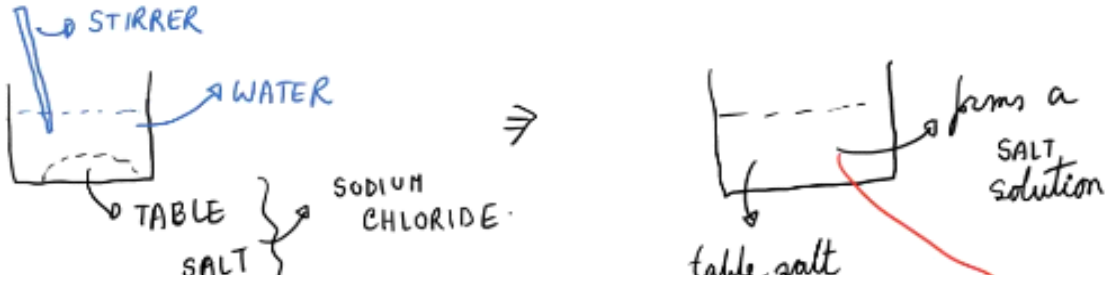
Pure sodium Element:

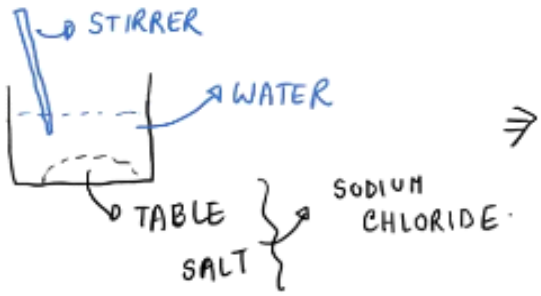
Since it contains only sodium atoms in the sodium elements, so it is a pure substance and nothing else is mixed with it.

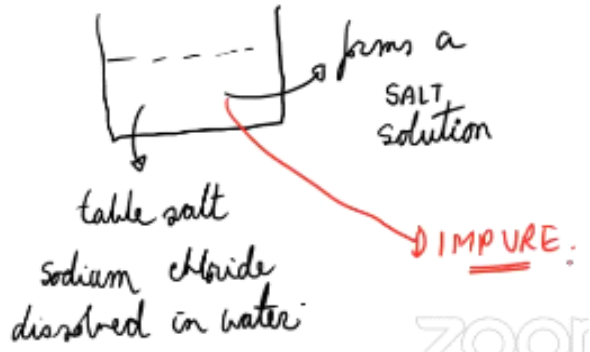


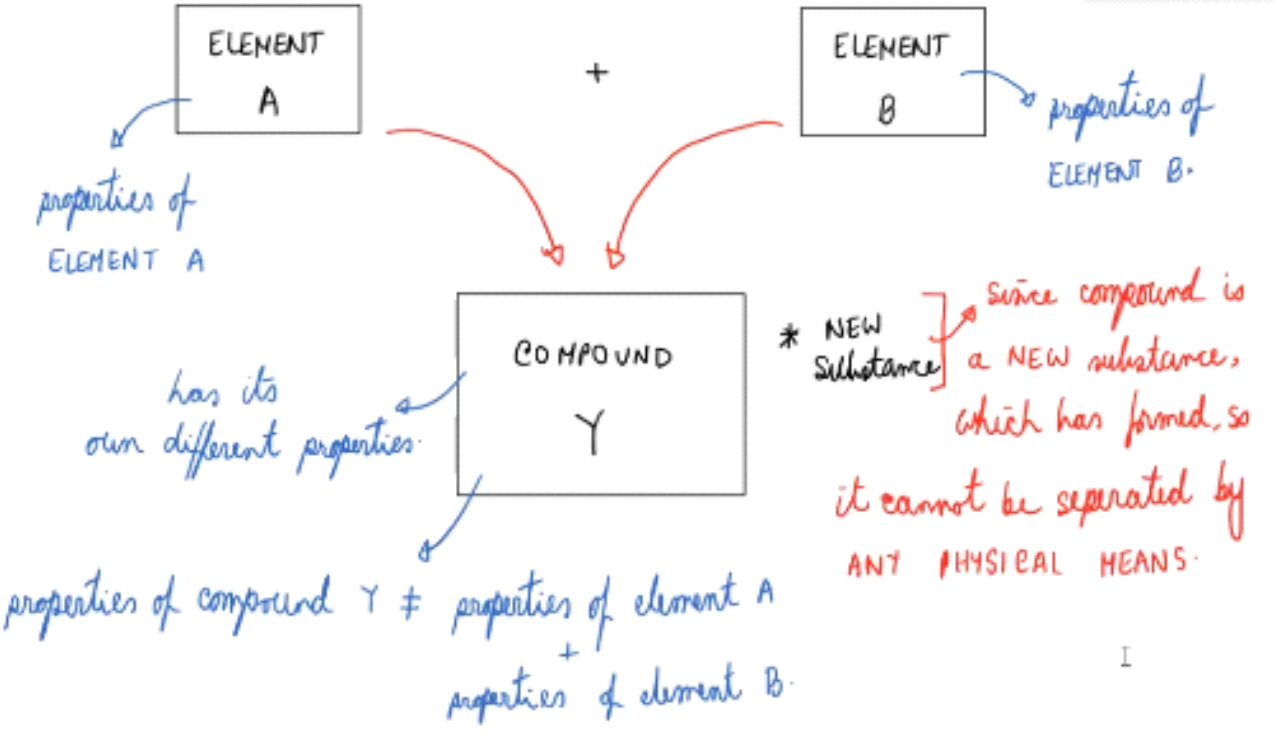


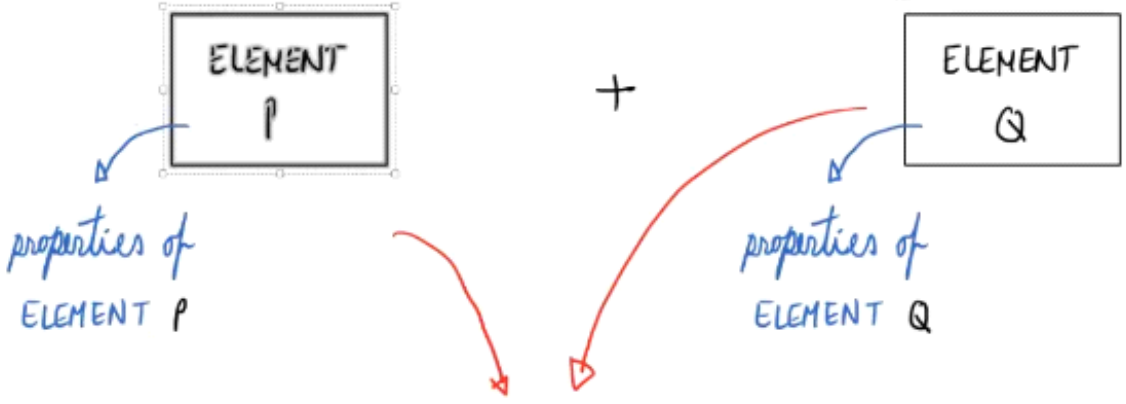




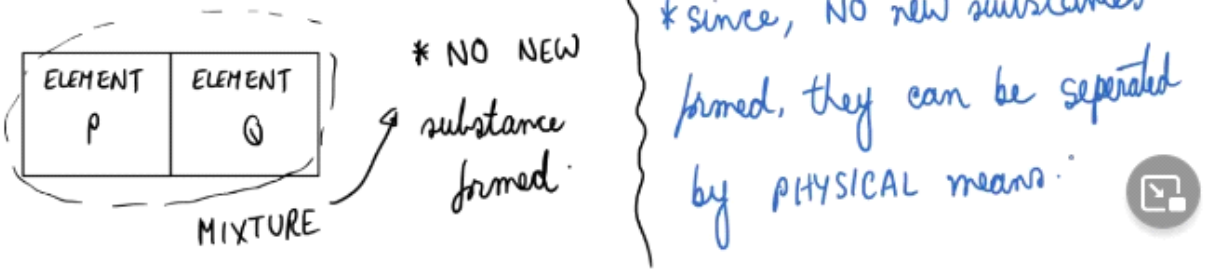

STIRRER
WATER
TABLE SALT
SODIUM CHLORIDE


forms a SALT solution
table salt
Sodium chloride dissolved in water
IMPURE.


ELEMENT A
+
ELEMENT B
properties of ELEMENT A
properties of ELEMENT B.
COMPOUND Y
has its own different properties.
properties of compound Y ≠ properties of element A + properties of element B.
* NEW Substance
Since compound is a NEW substance, which has formed, so it cannot be separated by ANY PHYSICAL MEANS.


ELEMENT P
+
ELEMENT Q
properties of ELEMENT P
properties of ELEMENT Q

if NO bonding occurs between them, then they MIX together
└ and forms a MIXTURE.
(NO NEW substances forms).



Pure Substance -

The word 'pure' is used in chemistry in a different way from its everyday meaning. For example, shops sell cartons labelled as 'pure' orange juice. The label means that the contents are just orange juice, with no other substances added. However, the juice is not pure in the chemical sense, because it contains different substances mixed together.

In chemistry, a pure substance consists only of one element or one compound.

Mixture –

On the other hand, a mixture consists of two or more different substances, **not chemically joined together**. For example, a packet of sweets may contain a mixture of different colored sweets. The sweets are not joined to each other, so they can be picked out and put into separate piles.

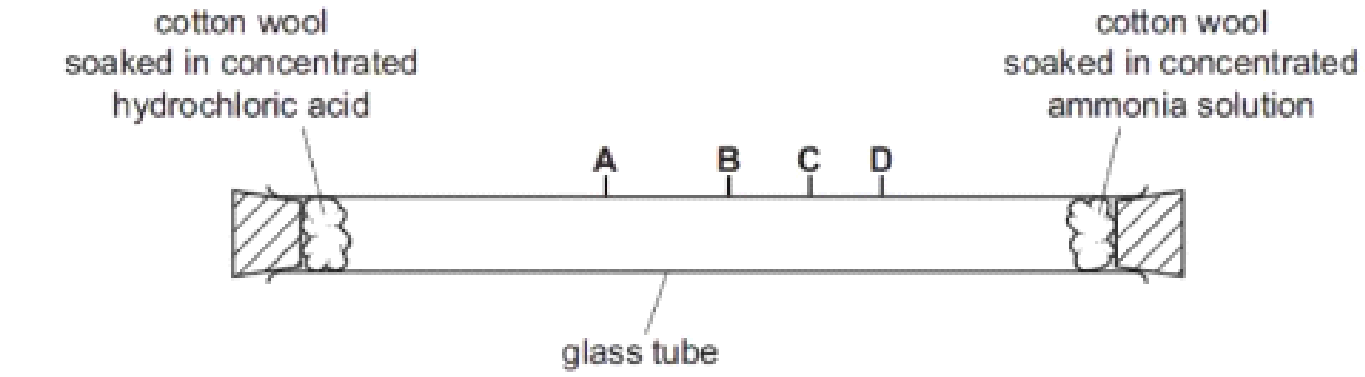
The substances in a mixture can be elements, or compounds, or both. Being part of a mixture does not change the chemical properties of the substances that are in it.

Major Differences Between Mixture & Compound –

MIXTURE	COMPOUND
It contains two or more substances	It is a single substance.
The composition can vary.	The composition is always the same.
No chemical change takes place when a mixture is formed.	When the new substance is formed, it involves chemical change.
The properties are those of the individual elements or compounds.	The properties are very different to those of the composed elements.
The components may be separated quite easily by physical means.	The components can only be separated by one or more chemical reactions.

Concentrated ammonia solution gives off ammonia gas. Concentrated hydrochloric acid gives off hydrogen chloride gas. Ammonia, NH_3, and hydrogen chloride, HCl, are both colourless gases. Ammonia reacts with hydrogen chloride to make the white solid ammonium chloride.

Apparatus is set up as shown.



After ten minutes a white solid forms in the tube where the gases meet.

(a) (i) Write the chemical equation for the reaction of ammonia with hydrogen chloride.

$NH_3 + HCl \longrightarrow NH_4Cl$ [1]

(ii) Name the process by which the ammonia and hydrogen chloride gases move in the tube.

DIFFUSION [1]

(iii) At which point, **A**, **B**, **C** or **D**, does the white solid form? Explain why the white solid forms at that point.

the solid forms at A

explanation Hydrogen Chloride gas is HEAVIER than Ammonia gas.
So, it travels LESSER distance than Ammonia. [3]

(iv) The experiment was repeated at a higher temperature.

Predict how the results of the experiment would be different. Explain your answer.

The white solid will takes LESSER time to form. Because
- at a HIGHER temperature, the particles have HIGHER kinetic energy.
- so, the particles MOVE/DIFFUSE/TRAVEL faster. [3]