Changes occurring in a chemical change-

Chemical changes occurring in our day to day life involves following changes-

- **Change in colour-**

  During rusting the iron articles undergoes change in colour. We have also observed that silver gets tarnished when kept for a long time.

The metallic silver reacts with hydrogen sulphide or sulphur present in air and gets tarnished.

$$4Ag + 2H_2S + O_2 \longrightarrow 2Ag_2S + 2H_2O$$

Polished Silver

Tarnished Silver

The colour of the product may differ from that of the reactants.

For example; copper sulphate is blue in colour, but after reacting with iron, the product formed (iron sulphate) is of green colour.

ACTIVITY-

Dissolve about a teaspoonful of copper sulphate (blue vitriol or neela thotha) in about half a cup of water in a glass tumbler or a beaker. Add a few drops of dilute sulphuric acid to the solution. You should get a blue coloured solution.

Save a small sample of the solution in a test tube or a small glass bottle. Drop a nail or a used shaving blade into the remaining solution.

Wait for half an hour or so. Observe the colour of the solution.

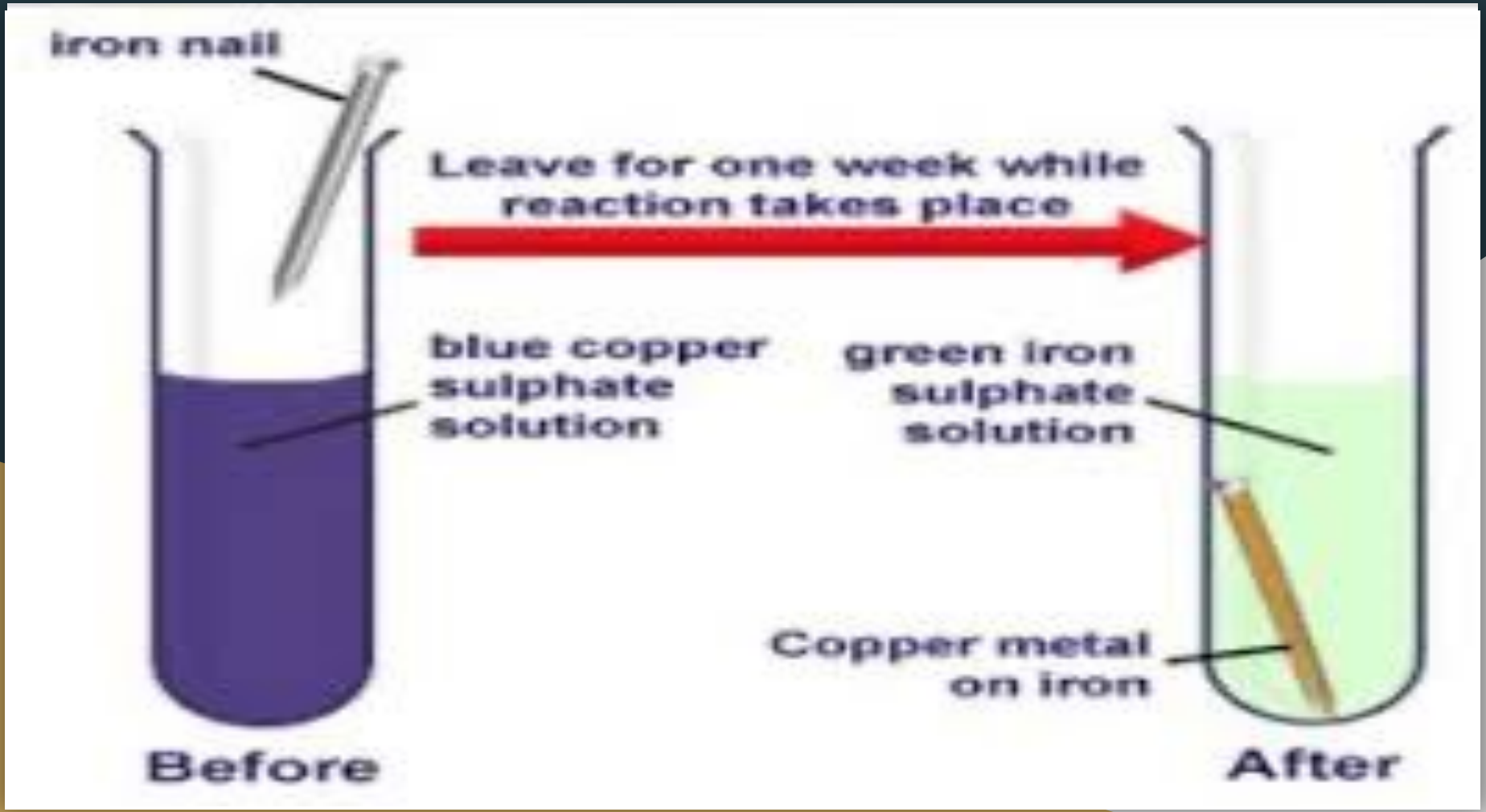
Compare it with the colour of the sample solution saved separately. Take out the nail or the blade.

The changes that you notice are due to a reaction between copper sulphate and iron.

The change of colour of the solution from blue to green is due to the formation of iron sulphate, a new substance. The brown deposit on the iron nail is copper, another new substance.

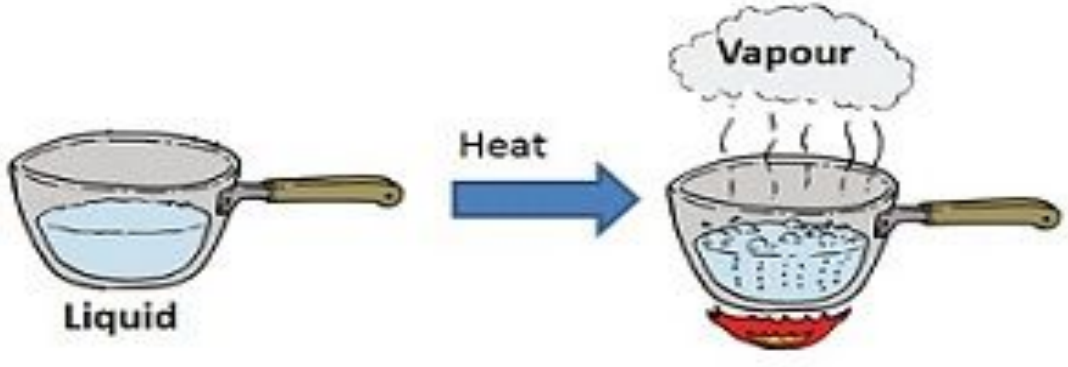
$$Fe + CuSO_4 \rightarrow Cu + FeSO_4$$

Copper sulphate solution (blue) + Iron → Iron sulphate solution (green) + Copper (brown deposit)


iron nail
Leave for one week while reaction takes place
blue copper sulphate solution
green iron sulphate solution
Copper metal on iron
Before
After

- **Change in state-**

On heating liquid changes its state and converts to vapour due to reaction within the particles caused by heat.



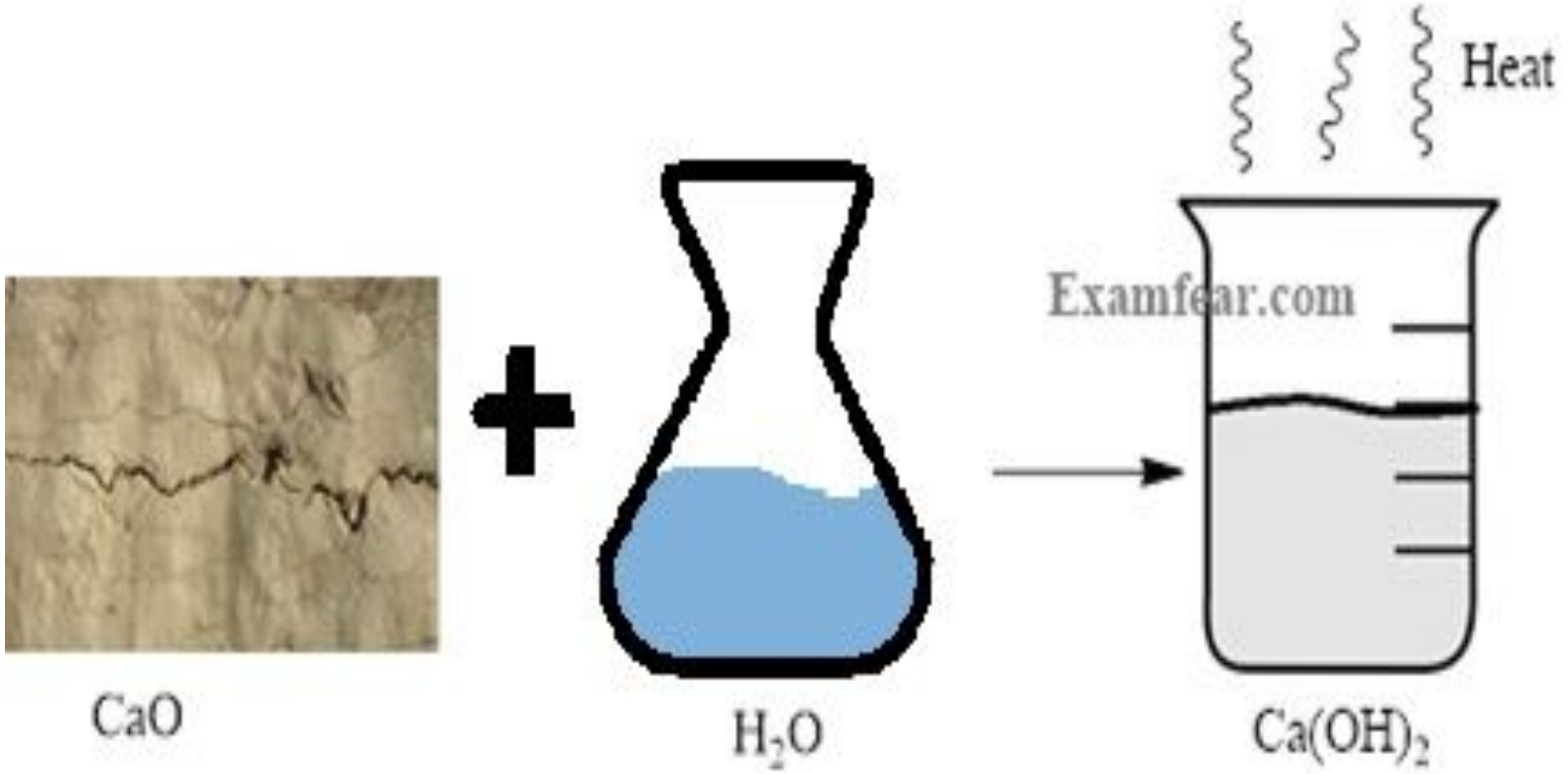
- **Change in odour-**

Due to chemical reaction food gets spoiled and smells really bad.

Fig. Fresh apple (left) Spoiled Food (right)

- **Change in temperature-**

Lime when mixed with water undergoes certain change that rises its temperature and makes it evolve heat and give a clear solution. Such reactions are called exothermic reactions.


Heat
Examfear.com
CaO
H_2O
$Ca(OH)_2$

- **Release of gas-**

During Aerobic cellular respiration in human body energy molecules combines with inhaled oxygen and releases energy needed by the cells. It also releases Carbon Dioxide gas and water. Here is the overall equation for aerobic cellular respiration:

$$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2\ \textbf{(released gas)} + 6H_2O + \text{energy}$$

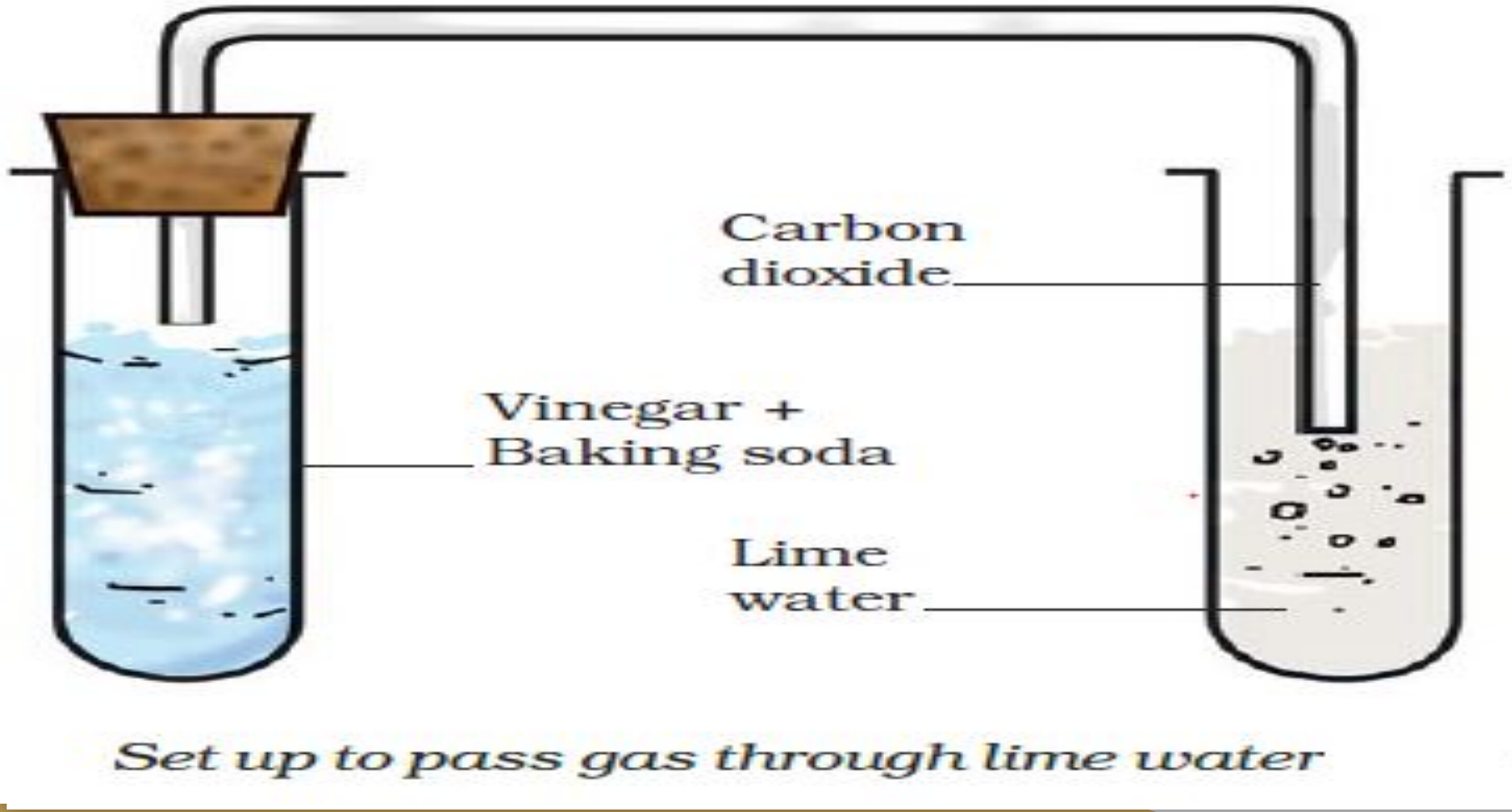
Some other chemical changes also produce gases. Generally the gases produced can be carbon dioxide(shown on the slide above), hydrogen, ammonia etc. The presence of carbon dioxide can be confirmed as it turns lime water milky.

Activity:

Reaction between vinegar and baking soda:

Take vinegar (acetic acid) in a glass beaker and add a pinch of baking soda (sodium hydrogen carbonate) to it.

We will observe gas bubbles coming out of the beaker(effervescence). This is due to the release of carbon dioxide. This can be confirmed by making the gas produced pass through freshly prepared lime water. The lime water turns milky when carbon dioxide is passed through it due to the formation of calcium carbonate.



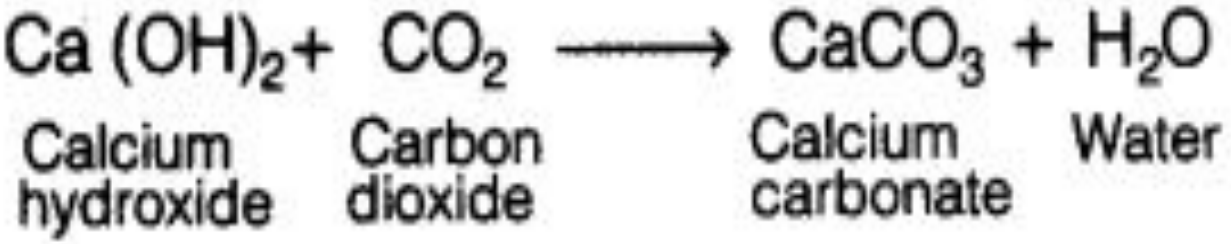
Set up to pass gas through lime water

PLENARY -

Q. Complete the following reaction

Ca (OH)2 + CO2 → _____ + _____

A.



Q. Name the gas which turns lime water milky.

A. Carbon dioxide gas (CO_2) turns lime water milky.

ASSESSMENT/EVALUATION -

Q.What is the nature of magnesium oxide solution?

A.Magnesium oxide is basic in nature because it turns red litmus solution to blue.

Q. Name the process by which common salt is obtained from sea water.

A.The common salt can be obtained by the evaporation of seawater.