

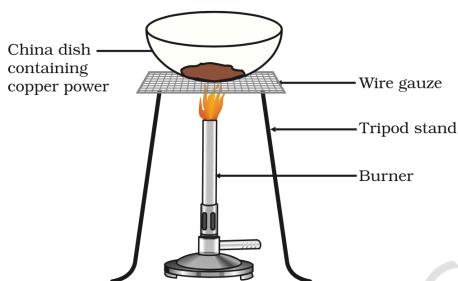
IMAGE**DESCRIPTION generated from TEMPLATE**

Figure 1.10
Oxidation of copper to copper oxide



Caption: Oxidation of copper to copper oxide

No. of objects: 4

What are the objects: China Dish containing copper powder, Wire Gauze, Tripod Stand, Burner

Left 2 right OR Top 2 Bottom: Top 2 bottom

How are the objects placed: Burner at the bottom, Wire Gauze on the Tripod Stand, China Dish on Gauze, Gauze on Stand

How are these interacting: Copper Powder in the China Dish is heated using the burner.

Blue: Relative Positioning

Green: From the surrounding text

Black: Labels + Caption

Red: Currently can't be obtained from above 3 options

Description:

At the bottom there is a burner, with a tripod stand and wire gauze over it. On the wire gauze there is a China dish containing copper powder heated using the burner. Image shows Oxidation of copper to copper oxide.

Comment: Book mentions "China Dish containing copper powder is heated", but doesn't mention it is done by the burner.

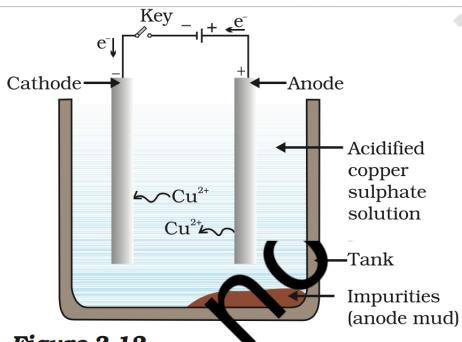


Figure 3.12
Electrolytic refining of copper. The electrolyte is a solution of acidified copper sulphate. The anode is impure copper, whereas, the cathode is a strip of pure copper. On passing electric current, pure copper is deposited on the cathode.

Caption: Electrolytic refining of copper...

No. of objects: 5

What are the objects: Cathode, Anode, Acidified CuSO₄, Tank, Impurities (anode mud). Left 2 right OR Top 2 Bottom: -

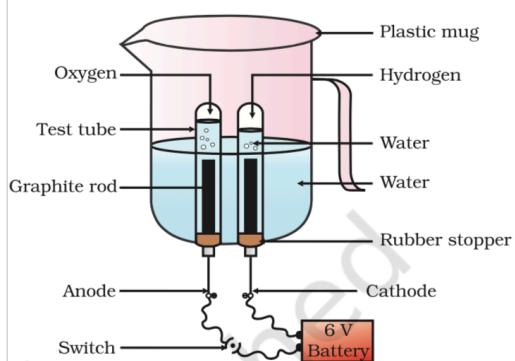
How are the objects placed: Cathode on left, Anode on right, they are immersed in the solution, tank is filled with acidified CuSO₄ solution. Impurities are at the bottom.

How are these interacting: Tank is filled with acidified CuSO₄ solution, Cathode, Anode dipped inside the CuSO₄ solution. Current passes through the electrolyte. Impurities are present at the bottom of anode inside in the tank.

Description:

A tank is filled with acidified CuSO₄ solution. Cathode on the left, Anode on the right are immersed in the electrolyte. On passing the electric current through electrolyte, pure Copper is deposited on the cathode and the impurities settle at bottom of anode. Image shows Electrolytic refining of Copper.

Comment: Electrolyte is same as the CuSO₄ soln is concluded from the text.



place water in the

Figure 1.6
Electrolysis of water

Caption: Electrolysis of Water

No. of objects: 10

What are the objects: Plastic mug, Hydrogen, Oxygen, Graphite rod, Water, Test tube, rubber stopper, anode, cathode, switch

Left 2 right OR Top 2 Bottom: -

How are the objects placed: Plastic mug filled with water, inverted test tubes inside water. Rubber stopper at the bottom of mug. Anode, cathode and switch are below the mug. Oxygen on left, hydrogen on right.

How are these interacting: Two holes are drilled at mug's base with rubber stoppers fitted in them. Carbon electrodes are inserted in these rubber stoppers. Electrodes are immersed in water. Two test tube filled with water are inverted over the two carbon electrodes. These electrodes are connected to 6V Battery.

Description:

There is a plastic mug filled with water. There are two holes drilled at mug's base with rubber stoppers fitted in them. Carbon electrodes are inserted in these rubber stoppers. These electrodes are immersed in water. Two test tubes are inverted over the two carbon electrodes. These electrodes are connected to 6V Battery, which is kept below the mug. Anode, Cathode and switch are present below the rubber stopper. Image shows Electrolysis of water.

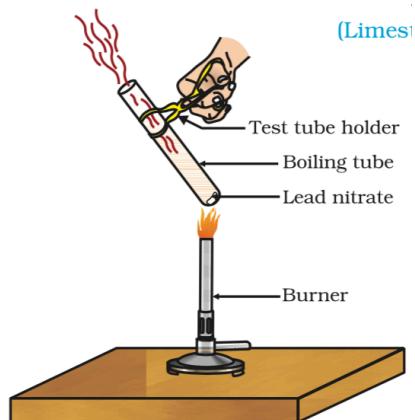
IMAGE**DESCRIPTION generated from TEMPLATE**

Figure 1.5
Heating of lead nitrate and emission of nitrogen dioxide

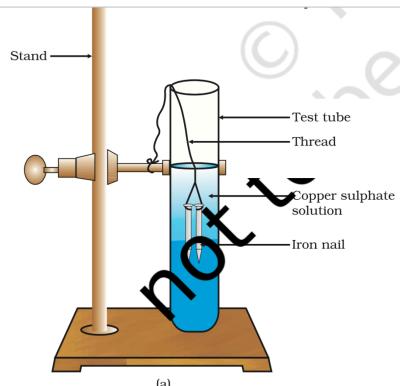


Figure 1.8
(a) Iron nails dipped in copper sulphate solution

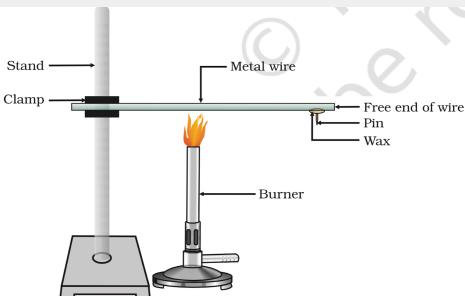


Figure 3.1
Metals are good conductors of heat.

Caption: Heating of lead nitrate & emission of nitrogen dioxide

No. of objects: 4

What are the objects: Test tube holder, boiling tube, lead nitrate, burner.

Left 2 right OR Top 2 Bottom: Top to bottom

How are the objects placed: burner at bottom, boiling tube over it, lead nitrate at bottom of the tube.

Colours: Brown fumes

How are these interacting: Boiling tube held using holder, burner is heating the lead nitrate inside tube.

Description:

Lead Nitrate in a boiling tube is heated **using a burner kept below it**. The boiling tube is held using a test tube holder. Brown fumes of nitrogen dioxide are emitted. Image shows heating of lead nitrate and emission of nitrogen dioxide.

Comment: Book mentions it is heated over the flames (not burner explicitly).

Caption: Iron nails dipped in copper sulphate solution.

No. of objects: 5

What are the objects: Stand, Test tube, Thread, Copper Sulphate Solution, Iron nail

Left 2 right OR Top 2 Bottom: Top to bottom

How are the objects placed: CuSO₄ Solution inside test tube, iron nail inside the solution, thread is above the nails, stand on the left of the test tube.

How are these interacting: thread is tied to the nails, test tube held by stand.

Description:

There is **copper sulphate solution in a test tube**. **2 iron nails are immersed in the Copper Sulphate solution with a thread tied to the nails**. **Test tube is held using a stand on left**. The image shows iron nails dipped in copper sulphate solution.

Caption: Metals are good conductors of heat

No. of objects: 7

What are the objects: Stand, Clamp, Metal Wire, Free end of wire, Pin, Wax, Burner

Left to right OR Top to Bottom: -

How are the objects placed: Burner at the bottom, metal wire above it. Stand with clamp on the left. Pin, wax on the right end of the metal wire.

How are they interacting: Metal Wire is clamped on the stand. Pin is fixed to the free end of the wire using wax. Wire is heated with the burner.

Description:

There is a **metal wire clamped on the stand**, which is **placed on the left**. On the right a pin is fixed to the free end of the wire using wax. There is a burner **at the bottom** which is **heating the wire close to the clamp**. The image shows metals are good conductors of heat.

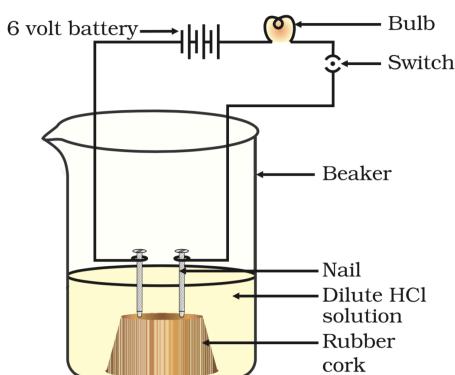
IMAGE**DESCRIPTION generated from TEMPLATE**

Figure 2.3
Acid solution in water
conducts electricity

Caption: Acid solution in water conducts electricity.

No. of objects: 7

What are the objects: 6 volt battery, Bulb, switch, beaker, nail, dilute HCl solution, Rubber Cork.

Left to right OR Top to Bottom: -

How are the objects placed: 6 volt battery above the beaker, Bulb and switch on the top right of the beaker. Beaker filled with Dilute HCl solution, Rubber cork at the bottom of the beaker, nail on the rubber cork.

How are they interacting: 2 nails fixed on the cork, Nails connected to the two terminals of 6 volt battery through a bulb and a switch.

Description:

There is a beaker filled with Dilute HCl solution. There is a 6 volt battery above the beaker with a bulb and a switch on the top right of the beaker. A rubber cork is placed at the bottom of the beaker, with 2 nails fixed on the cork. Those nails are connected to the two terminals of 6 volt battery through bulb and switch. The image shows Acid solution in water conducts electricity.

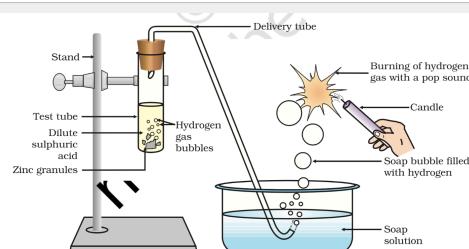


Figure 2.1 Reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning

Caption: Reaction of

No. of objects: 10

What are the objects: ... [list of all the labels]

Left to right OR Top to Bottom: -

Colours (if any):

How are the objects placed: Stand is on the left holding a test tube on its right, test tube contains Dilute H₂SO₄ + Zinc granules. Soap solution is at the bottom right, with a candle above it. Delivery tube is connecting the test tube on the left to the soap solution on the bottom right.

How are they interacting: Gas is evolved from the test tube, which is passed through the soap solution. Bubbles are formed in the soap solution. Burning candle is taken near a gas-filled bubble.

Description:

There is a stand on the extreme left which is holding a test tube to its right. This test tube is filled with Dilute Sulphuric Acid and few Zinc granules are added to it. There is a soap solution at the bottom right with a candle above it. There is a delivery tube connecting the test tube on the left to the soap solution on the bottom right. A gas is evolved from the test tube, which is passed through the soap solution. Bubbles are formed in the soap solution and a Burning candle is taken near a gas filled bubble. The image shows reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning.

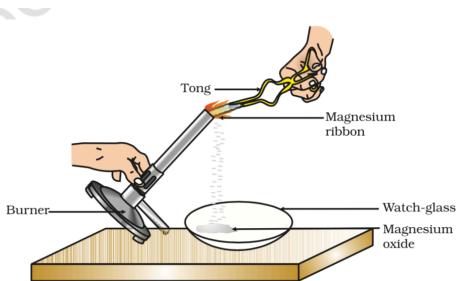


Figure 1.1
Burning of a magnesium ribbon in air and collection of magnesium oxide in a watch-glass

Caption: Burning of a magnesium ribbon in air and ...

No. of objects: 5

What are the objects: Burner, Tong, Magnesium Ribbon, Watch glass, Magnesium oxide

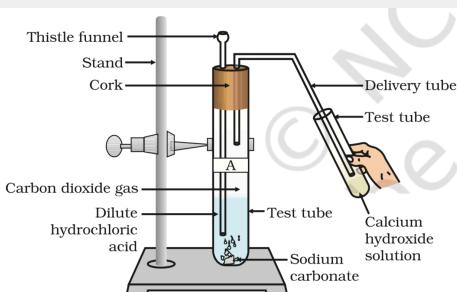
Left to right OR Top to Bottom: -

How are the objects placed: Burner on the left, magnesium ribbon and tong on the top, watch glass and magnesium oxide at the bottom.

How are they interacting: Mg Ribbon is held using a pair of tongs, The ribbon is burnt using the burner, ash is collected in the watch glass.

Description:

Magnesium Ribbon is held using a pair of tongs at the top in the air. Magnesium ribbon is burnt using the burner on the left. Magnesium oxide is collected in the watch glass at the bottom. The image shows Burning of a magnesium ribbon in air and collection of magnesium oxide in a watch glass.

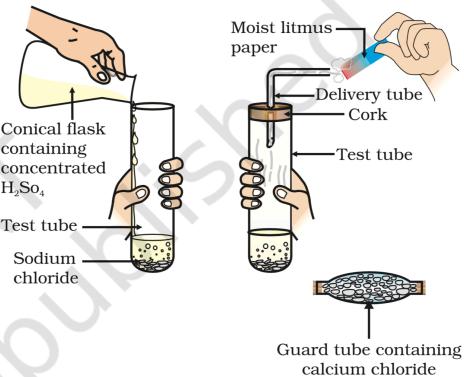
IMAGE**DESCRIPTION generated from TEMPLATE****Figure 2.2**

Passing carbon dioxide gas through calcium hydroxide solution

Caption: Passing CO₂ through Calcium Hydroxide solution.
No. of objects: 10
What are the objects: [list of all the labels]
Left to right OR Top to Bottom: -
How are the objects placed: There are two test tubes, the one on left contains Sodium Carbonate at its bottom and cork on its top, with thistle funnel inside it. The right one has Calcium hydroxide solution inside it.
How are they interacting: HCl is added to the test tube on left. Carbon dioxide gas is produced in that test tube, which is passed through lime water (Ca(OH)₂) using the delivery tube connecting the two test tubes.

Description:

There are two test tubes, the one on left contains Sodium Carbonate at its bottom and cork on its top with a thistle funnel inside it. The right one has Calcium hydroxide solution inside it. Dilute hydrochloric acid is added to the test tube on left. Carbon dioxide gas is produced in that test tube, which is passed through lime water (Ca(OH)₂) using the delivery tube connecting the two test tubes. The images shows passing carbon dioxide gas through Calcium Hydroxide solution.

**Figure 2.4 Preparation of HCl gas**

Caption: Preparation of HCl gas.

No. of objects: 8

What are the objects: -

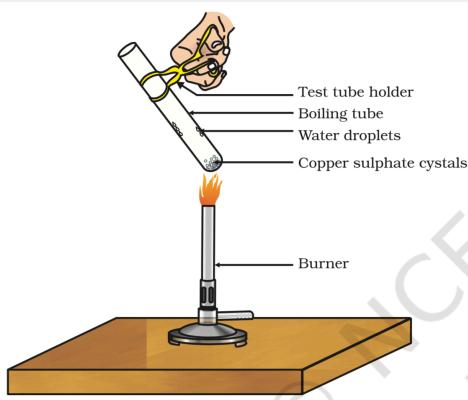
Left to right OR Top to Bottom: -

How are the objects placed: There are two test tubes. In the left one, there is sodium chloride at the bottom, and on top left of it there is a conical flask containing Concentrated H₂SO₄. The right test tube has a cork at its top with a delivery tube fitted in it. It also has a moist litmus paper on its top right. There is a guard tube containing Calcium Chloride on the bottom right.

How are they interacting: H₂SO₄ is added to the left test tube containing NaCl. A gas is evolved which is passed through the delivery tube to test it on the moist litmus paper. To dry the gas evolved it can be passed through a guard tube containing Calcium Chloride.

Description:

There are two test tubes. In the left one, there is sodium chloride at the bottom, and on top left of it there is a conical flask containing Concentrated H₂SO₄. The right test tube has a cork at its top with a delivery tube fitted in it. It also has a moist litmus paper on its top right. H₂SO₄ is added to the left test tube containing NaCl. In the right test tube a gas is evolved which is passed through the delivery tube to test it on the moist litmus paper. To dry the gas evolved it can be passed through a guard tube containing Calcium Chloride on the bottom right. The images shows Preparation of HCl gas.



Caption: Removing water of crystallization.

No. of objects: 5

What are the objects:

Left to right OR Top to Bottom: Top to Bottom

How are the objects placed: There is a burner at the bottom with a boiling tube above it. Also a test tube holder at the top. There are water droplets inside the boiling tube and Copper sulphate crystals at the bottom of it.

How are they interacting: CuSO₄ crystals in the boiling tube are heated using the burner. boiling tube is held using the test tube holder

Description: There is a burner at the bottom with a boiling tube above it, which is held using the test tube holder at the top. There are water droplets inside the boiling tube and Copper sulphate crystals at the bottom of it. CuSO₄ crystals in the boiling tube are heated using the burner. The images shows Removing water of crystallization.

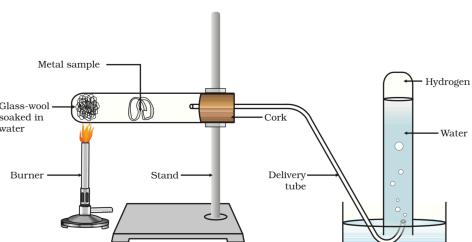
IMAGE**DESCRIPTION generated from TEMPLATE**

Figure 3.3 Action of steam on a metal

Caption: Action of steam on a metal.**No. of objects:** 8**What are the objects: -****Left to right OR Top to Bottom: -**

How are the objects placed: Burner on the bottom left, a cork fitted horizontal test tube above it, which has glass wool at its bottom (just above the burner) and a metal sample in the middle. Delivery tube connects test tube to an inverted test tube on the right containing water.

How are they interacting: Glass-wool soaked in water is being heated by the burner, the steam passes through the metal. Any evolved gas is passed through the delivery tube to the test tube on right.

Description:

There is a burner **on the bottom left**. With a **cork fitted horizontal test tube above it**. The test tube contains **glass wool at its bottom (just above the burner)** and a **metal sample in the middle**. Delivery tube **connects test tube to an inverted test tube on the right containing water**. Glass-wool soaked in water is **being heated by the burner**. **The steam acts on the metal**. **Any evolved gas is passed through the delivery tube to the test tube on right**. The image shows Action of steam on a metal.

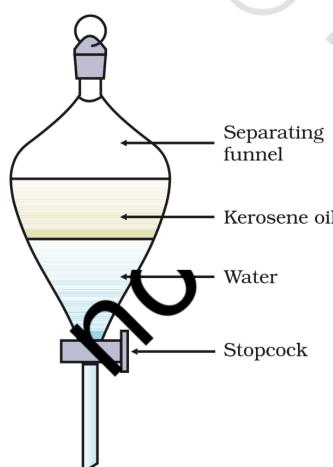


Fig. 2.6: Separation of immiscible liquids

Caption: Separation of immiscible liquids.**No. of objects:** 4**What are the objects:** separating funnel, kerosene oil, water, stopcock.**Left to right OR Top to Bottom:** Top to Bottom

How are the objects placed: There is separating funnel with a stopcock at its bottom. It contains Kerosene oil and water inside it, with water at the bottom and kerosene oil over it.

How are they interacting: -

Description: There is separating funnel with a **stopcock at its bottom**. It contains **Kerosene oil and water separated inside it**, with **water at the bottom and kerosene oil over it**. The image shows Separation of immiscible liquids.

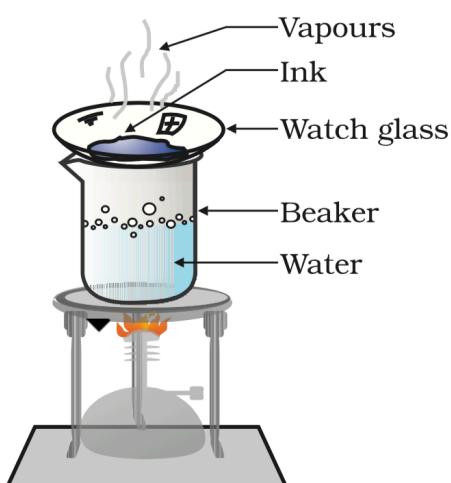


Fig. 2.5: Evaporation

Caption: Evaporation**No. of objects:** 5**What are the objects: -****Left to right OR Top to Bottom:** Top to Bottom

How are the objects placed: Beaker filled with water. A watch glass containing few drops of ink is placed over the beaker. Vapours on the top.

How are they interacting: Beaker is heated. Evaporation is taking place from the watch glass.

Description:

There is a **Beaker filled with water**. A **watch glass containing few drops of ink** is **placed over the beaker**. Beaker is heated. **Evaporation takes place from the watch glass** and there are **vapours at the top**. The image showed evaporation.

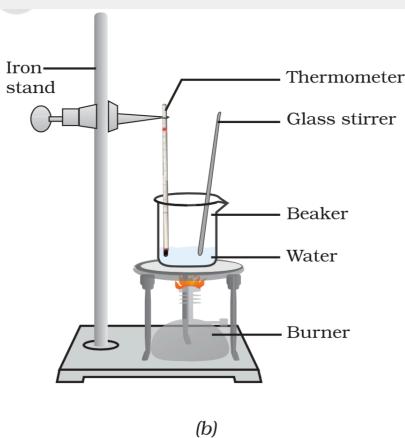
IMAGE**DESCRIPTION generated from TEMPLATE**

Fig. 1.6: (a) Conversion of ice to water, (b) conversion of water to water vapour

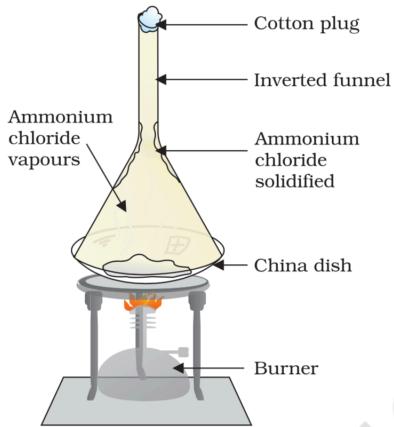


Fig. 1.7: Sublimation of ammonium chloride

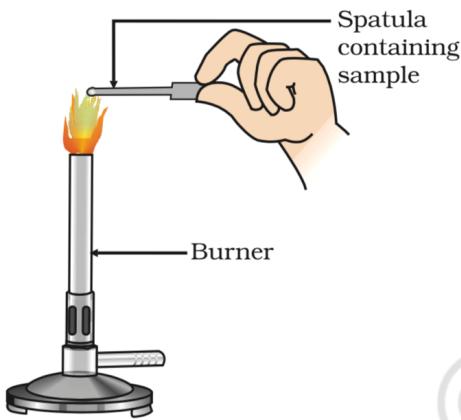


Figure 3.7
Heating a salt sample on a spatula

Caption: Conversion of water to water vapour.

No. of objects: 6

What are the objects: -

Left to right OR Top to Bottom: Top to Bottom

How are the objects placed: Burner at the bottom, with a beaker over it containing water. Beaker also contains a glass stirrer and a thermometer.

How are they interacting: Beaker is heated using the burner. Thermometer is suspended in the beaker using the stand.

Description:

Burner at the bottom, with a beaker over it containing water. Beaker also contains a glass stirrer and a thermometer is suspended in the beaker using the stand on the left. Beaker is heated using the burner. The images shows conversion of water to water vapour.

Caption: Sublimation of ammonium chloride.

No. of objects: 6

What are the objects: -

Left to right OR Top to Bottom: Top to Bottom

How are the objects placed: There is a burner at the bottom with a China Dish over it. China dish contains Ammonium Chloride in it. There is an inverted funnel over the China Dish, with a cotton plug on the stem of the funnel.

How are they interacting: China Dish is heated by the burner, which results in the ammonium chloride vapours in the funnel.

Description:

There is a burner at the bottom with a China Dish over it. China dish contains Ammonium Chloride in it. There is an inverted funnel over the China Dish, with a cotton plug on the stem of the funnel. China Dish is heated by the burner, which results in the ammonium chloride vapours in the funnel. The images shows sublimation of ammonium chloride.

Caption: Heating a salt sample on a spatula.

No. of objects: 2

What are the objects: -

Left to right OR Top to Bottom: -

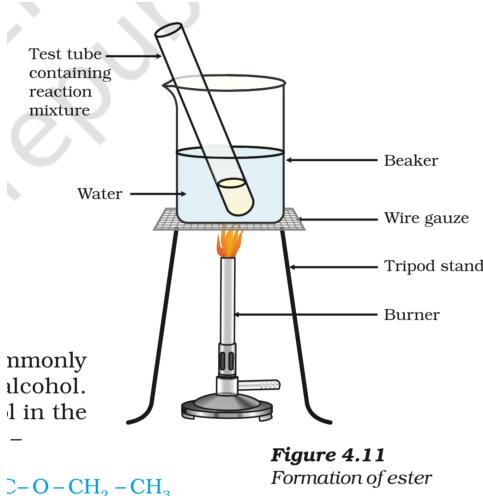
Colours (if any):

How are the objects placed: Burner at the bottom with a spatula containing sample over it.

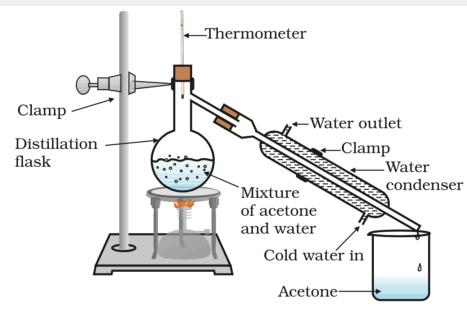
How are they interacting: Sample is heated by the burner.

Description:

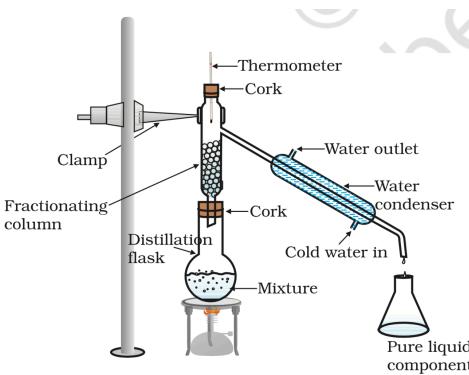
There is a burner at the bottom which heats the spatula containing sample kept above it. The image shows Heating a salt sample on a spatula.

IMAGE**DESCRIPTION generated from TEMPLATE****Caption:** Formation of ester**No. of objects:** 6**What are the objects:** -**Left to right OR Top to Bottom:** Top to Bottom**Colours (if any):****How are the objects placed:** Burner at the bottom with a tripod stand over it. There is a wire gauze on the tripod stand and a beaker kept on the wire gauze which contains water. Beaker also contains a test tube containing reaction mixture.**How are they interacting:** The beaker is being heated by the burner. The warm bath heats the reaction mixture.**Description:**

There is a burner **at the bottom** with a tripod stand **over it**. There is a wire gauze **on the tripod stand** and a beaker **kept on the wire gauze which contains water**. Beaker **also contains a** test tube containing reaction mixture. **The beaker is being heated by the burner**. **The warm bath heats the reaction mixture**. The image shows the formation of ester.

**Caption:** Separation of two miscible liquids by distillation.**No. of objects:****What are the objects:****Left to right OR Top to Bottom:****Colours (if any):****How are the objects placed:** On the left there is a distillation flask over a burner. There is a mixture of acetone and water inside the distillation flask.**How are they interacting:**

Description: **On the left** there is a distillation flask **over a burner**. There is a mixture of acetone and water **inside the distillation flask**. The **distillation flask** is fitted with a thermometer **on the top**. There is a water condenser **on the right of the flask**. The mixture in the flask is heated slowly. Acetone vaporises and then condenses in water condenser **on the right**. The acetone is **collected from the condenser outlet at the bottom right of the image**. The image shows Separation of two miscible liquids by distillation.

**Caption:** Fractional Distillation**No. of objects:****What are the objects:****Left to right OR Top to Bottom:****Colours (if any):****How are the objects placed:****How are they interacting:**

Description: The apparatus is similar to that for simple distillation, except that a **fractionating column** is fitted in between the **distillation flask** and the **condenser**. It is **fitted on top of the** distillation flask. <<Same description as for the image above, with this little edit>>. The image shows Fractional Distillation.

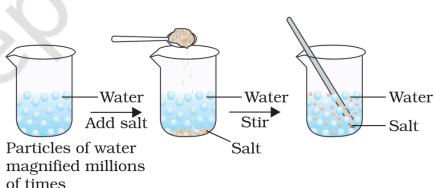
IMAGE**DESCRIPTION generated from TEMPLATE**

Fig. 1.1: When we dissolve salt in water, the particles of salt get into the spaces between particles of water.

Caption:

No. of objects: 3

What are the objects: Beakers

Left to right OR Top to Bottom: Left to Right

How are the objects placed: Side by Side (arrows in b/w)

How are these interacting: Salt added by spoon to the 2nd beaker, salt particles stirred with water particles by rod in 3rd beaker

Description: This is a **series of 3 diagrams** with a **beaker half filled with water**. These beakers **show particles of water magnified millions of times**. **Going from left to right** the beaker is half filled with water **shown by first beaker**. Then we **add salt to the beaker**, which **sits at the bottom** of the beaker, **shown by second beaker**. Then the **salt is dissolved in water by stirring using a glass rod**, **shown by the third beaker**. Image shows that when we dissolve salt in water, that particles of salt get into the spaces between particles of water.

Comment: Special format for left to right images depicting state of same object.

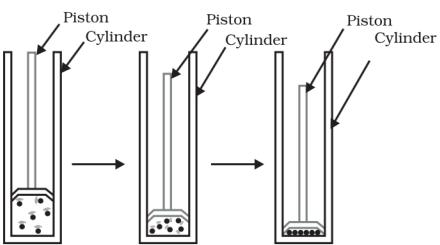


Fig. 1.8: By applying pressure, particles of matter can be brought close together.

Caption:

No. of objects: 6

What are the objects: 3 cylinders, 3 pistons

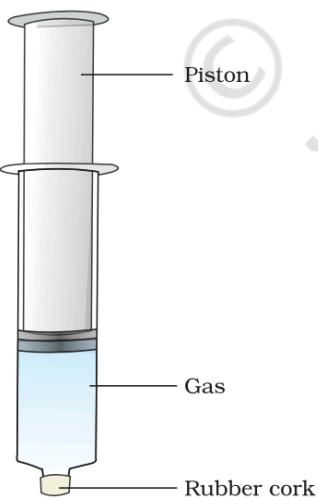
Left to right OR Top to Bottom: Left to right

How are the objects placed: Side by side (arrows in b/w)

How are these interacting: Piston moves downwards compressing the particles of matter.

Description: This is a **series of 3 diagrams** of a cylinder and a piston. **Going from left to right**, there is a **gas enclosed in a cylinder using the piston from above**, **shown by the first image**. Pressure is applied on the gas using the piston. **Piston moves downwards, compressing the particles of gas shown by second and third images**. The image shows that by applying pressure, the particles of matter can be brought close together.

Comment: Special format for left to right images depicting state of same object.



Caption:

No. of objects: 3

What are the objects: Syringe, Piston, Rubber Cork

Left 2 right OR Top 2 Bottom: Top to bottom

Colours (if any):

How are the objects placed: Piston is inside an inverted syringe, with rubber cork at the bottom.

How are these interacting: Gas trapped in b/w the piston and the syringe

Description: There is an **inverted** syringe with piston on **top**, gas in the **middle** and **rubber cork covering its nozzle at the bottom**.

IMAGE

DESCRIPTION generated from TEMPLATE

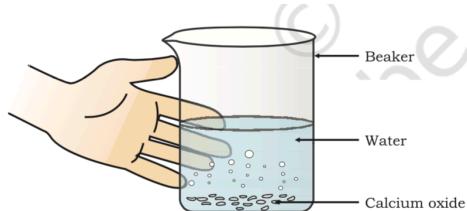


Figure 1.3
Formation of slaked lime by the reaction of calcium oxide with water

Calcium oxide reacts (calcium hydroxide) release

Caption: Formation of slaked lime by the reaction of calcium oxide and water.

No. of objects: 3

What are the objects:

Left to right OR Top to Bottom: Top to bottom

How are the objects placed: Water inside beaker, calcium oxide inside beaker.

How are they interacting:

Description: There is a **beaker** with **Calcium Oxide** inside it. **Water** is added **slowly into this beaker**. The image shows formation of slaked lime by the reaction of calcium oxide and water.

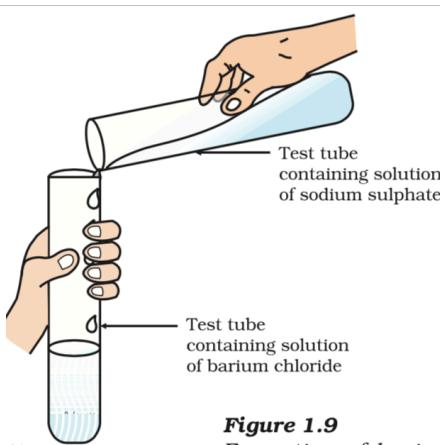


Figure 1.9
Formation of barium sulphate and sodium chloride

(1.27)

Caption: Formation of barium sulphate and sodium chloride

No. of objects: 2

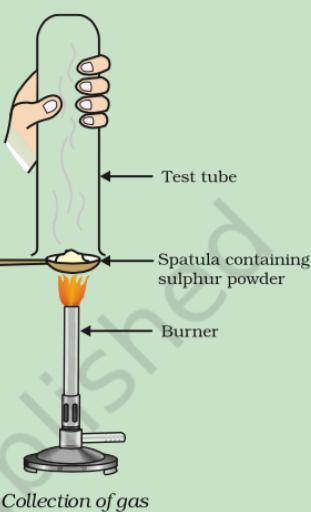
What are the objects:

Left to right OR Top to Bottom:

How are the objects placed:

How are they interacting:

Description: There is a test tube containing solution of barium chloride. **Above it** another test tube containing solution of sodium sulphate is used to **mix the two solutions**. The image shows formation of barium sulphate and sodium chloride.



Collection of gas

Caption: Collection of gas

No. of objects: 3

What are the objects:

Left to right OR Top to Bottom: Top to bottom.

How are the objects placed:

How are they interacting:

Description: There is **spatula** containing **sulphur powder**, which is heated using **a burner at the bottom** of the image. The **gas evolved** is collected using an **inverted test tube** over the spatula. The image shows collection of gas.

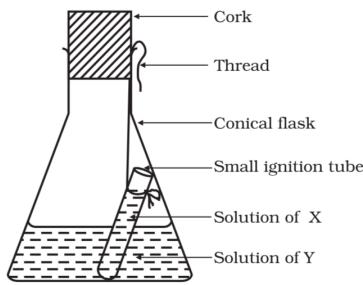
IMAGE**DESCRIPTION generated from TEMPLATE**

Fig. 3.1: Ignition tube containing solution of X, dipped in a conical flask containing solution of Y.

Caption: Ignition tube containing solution X, dipped in a conical flask containing solution of Y.

No. of objects: 6

What are the objects:

Left to right OR Top to Bottom:

How are the objects placed:

How are they interacting:

Description: There is an ignition tube which contains solution of X. It is dipped in a conical flask which contains solution of Y. The ignition tube is hanged in the flask carefully using the thread above it, not letting the two solutions get mixed. A cork is put on the flask. The image shows ignition tube containing solution X, dipped in a conical flask containing solution of Y.

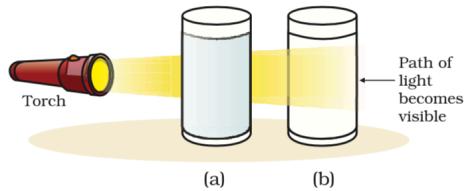


Fig. 2.3: (a) Solution of copper sulphate does not show Tyndall effect, (b) mixture of water and milk shows Tyndall effect.

Caption:

No. of objects: 3

What are the objects:

Left to right OR Top to Bottom: Left to Right

How are the objects placed:

How are they interacting:

Description: There is a torch on the left, with two beakers on its right (a) and (b). Left to right, the first beaker (a) contains a solution of copper sulphate which doesn't show Tyndall Effect. Whereas the beaker on the right (b) contains a mixture of water and milk and shows Tyndall Effect. The path of the light becomes visible in the right beaker.

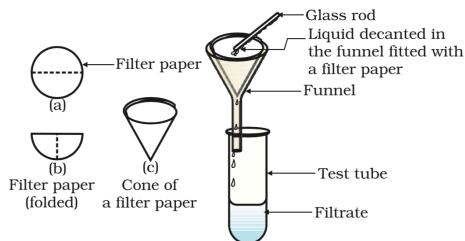


Fig. 2.2: Filtration

Caption:

No. of objects:

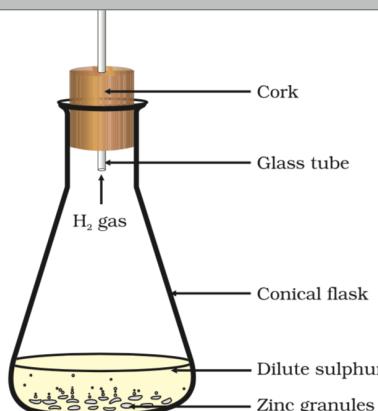
What are the objects:

Left to right OR Top to Bottom:

How are the objects placed:

How are they interacting:

Description: On the left there are 3 images of filter paper. On top left (a) is an unfolded filter paper, below that we have (b) with a folded filter paper, on the right of (b) we have a cone of a filter paper. The image on the right has a test tube with a funnel over it and filtrate inside it. The funnel has a filter paper inside it. There is a glass rod above the funnel. The liquid decanted in the funnel is filtered with the filter paper. The image shows filtration.

IMAGE**Figure 1.2**

Formation of hydrogen gas by the action of dilute sulphuric acid on zinc

1.1 CHEMISTRY

Activity 1.1 can be written as: 'Hydrogen gas is formed when zinc reacts with dilute sulphuric acid. It is a displacement reaction. Oxygen, it gets replaced by hydrogen. This is a single displacement reaction. It is a shorter form.'

DESCRIPTION generated from TEMPLATE**Caption:****No. of objects:** 6**What are the objects:****Left to right OR Top to Bottom:** Top to bottom**How are the objects placed:****How are they interacting:**

Description: Few zinc granules are taken in a conical flask. Dilute sulphuric acid is added to the flask. There is a glass tube passing through the cork on the top of the conical flask. The hydrogen gas formed, passes through the glass tube. The image shows the formation of hydrogen gas by the action of dilute sulphuric acid on zinc.

Observations:

- Some relative positions (e.g. test tube is filled with dilute HCl) also come from the text.
- Text belonging to the image also extends to the next page if image is at the end of a page.
- Description about some labels are given in the text indirectly, using "it" or some other different reference.
- Also some question is asked in one line (e.g. what did you observe?) and then in next line description about the answer to the question is given (e.g. Pass the gas evolved through).
- So for the two points above we have to take help from NLP to extract more info about the interaction of the objects.
- One more case is that text mentions doing the experiment for two different chemicals in similar way using two different test tubes labelled as A and B, but diagram shows the experiment for only one of them. So segregating the text in that case can be tricky.
- To ease the imagination part for the students, maybe we can start from a more commonly easy to identify object in the image (most cases at the bottom), then move in other directions from that object describing other objects one by one along with their interactions.

- If there are a lot of objects, like in the complicated diagrams. In the final description, first just describe the relative positions, so that the user gets the idea of the placement of the objects first and then start adding info about their interactions.
- For the simpler diagrams, the description can contain the relative positions along with the interactions between the objects.
- Sometimes good info about the image also comes from the caption itself.
- There are multiple info about the image labels in the surrounding text, but only some particular portions of those are relevant to image. Others might be extra ...
- Also, to find how much surrounding text is useful for an image is a challenge.
- Analysis needed using the blue and the green coloured parts of descriptions.

User Study Observations:

- The Words or objects children of class 10th were not aware of:
 - Spatula
 - over it
 - Distillation flask
 - Cork
 - Acetone
- The Words or objects children of class 9th were not aware of: