

Chemistry Study Materials for Class 9 (NCERT Based notes of Chapter -02)

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IS MATTER AROUND US PURE

SEPARATION OF COMPONENTS OF MIXTURE

SEPARATION OF DIFFERENT GASES FROM AIR

Air comprises of nitrogen, oxygen, carbon dioxide and argon as major components. Since air is the cheapest source of these gases, thus these are extracted from air at large scale

After liquefaction of air by repeated compression and cooling; nitrogen, oxygen, carbon dioxide and argon are extracted using fractional distillation.

Liquid nitrogen has boiling point equal to -190°C and thus turns into gas first and separated from air.

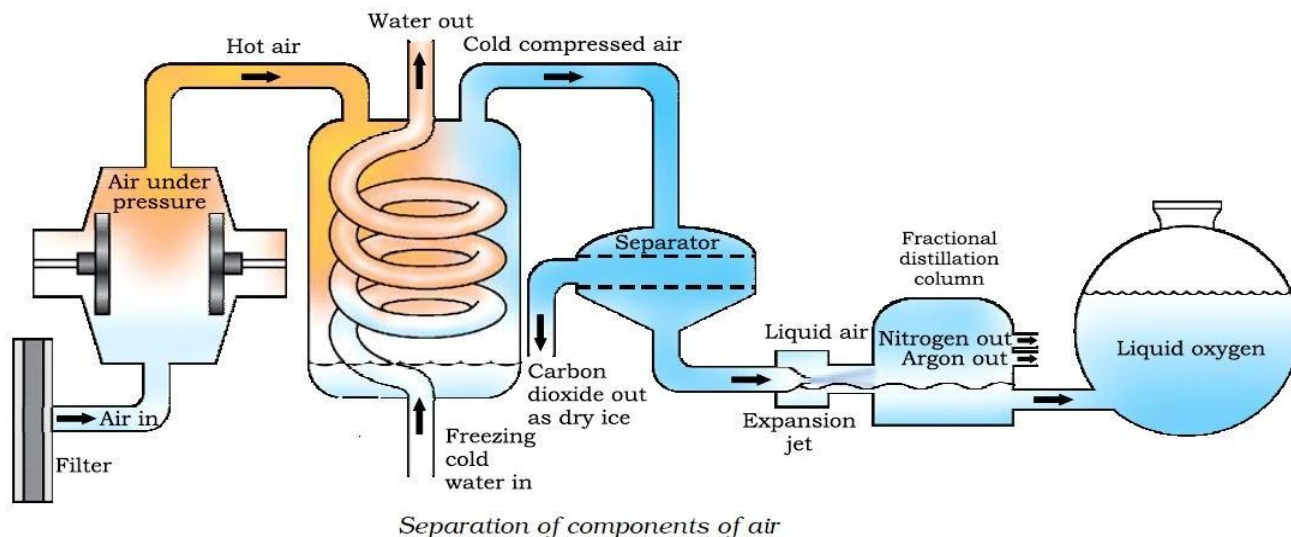
The boiling point of argon is -186°C , therefore it is extracted after argon.

The boiling point of oxygen is -183°C , thus it is collected after the extraction of argon.

Carbon dioxide turns into solid at a temperature of -97°C , therefore, it is removed while air is put under liquefaction.

USE

Nitrogen is used as fertilizers, oxygen is used in hospitals and argon is used in bulbs.



CRYSTALLIZATION

Crystallisation is a process that separates a pure solid in the form of its crystals from a solution. The crystallisation method is used to purify solids. For example, the salt we get from sea water can have many impurities in it. To remove these impurities, the process of crystallisation is used.

Crystallisation technique is better than simple evaporation technique as –

- Some solids decompose or some, like sugar, may get charred on heating to dryness.
- Some impurities may remain dissolved in the solution even after filtration. On evaporation these contaminate the solid.

APPLICATIONS

- Purification of salt that we get from sea water.
- Separation of crystals of alum (*phitkari*) from impure samples.

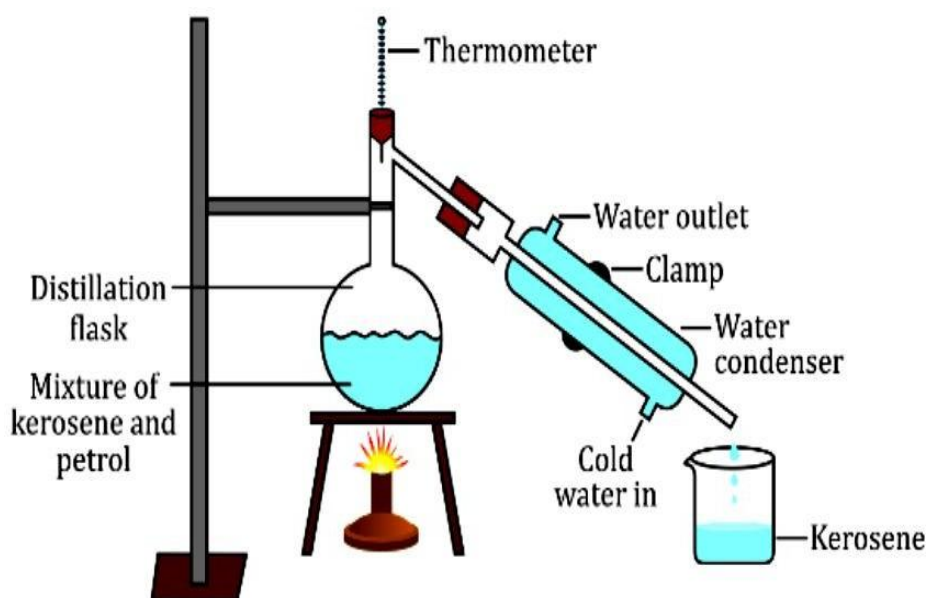
Thus, by choosing one of the above methods according to the nature of the components of a mixture, we get a pure substance.

With advancements in technology many more methods of separation techniques have been devised.

INTEXT QUESTIONS PAGE NO. 24

Q1. How will you separate a mixture containing kerosene and petrol (difference in their boiling points is more than 25°C), which are miscible with each other?

Answer:



A mixture of two miscible liquids having a difference in their boiling points more than 25°C can be separated by the method of distillation. Thus, kerosene and petrol can be separated by distillation.

In this method, the mixture of kerosene and petrol is taken in a distillation flask with a thermometer fitted in it. We also need a beaker, a water condenser, and a Bunsen burner. The apparatus is arranged as shown in the above figure. Then, the mixture is heated slowly. The thermometer should be watched simultaneously. Kerosene will vaporize and condense in the water condenser. The condensed kerosene is collected from the condenser outlet, whereas petrol is left behind in the distillation flask.

Q2. Name the technique to separate

(i) butter from curd, (ii) salt from sea-water, (iii) Camphor from salt.

Answer:

(i) Butter can be separated from curd by centrifugation.

(ii) Salt can be separated from sea-water by evaporation.

(iii) Camphor can be separated from salt by sublimation.

Q3. What types of mixtures are separated by the technique of crystallisation?

Answer:

By the technique of crystallization, pure solids are separated from impurities.

For example, salt obtained from sea is separated from impurities; crystals of alum (Phitkari) are separated from impure samples.

PHYSICAL CHANGE: The change in which no new substance is formed is called a physical change. During a physical change, chemical properties do not change but physical properties do change.

CHEMICAL CHANGE: The change in which a new substance is formed is called a chemical change. During a chemical change, chemical properties change.

