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

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IS MATTER AROUND US PURE

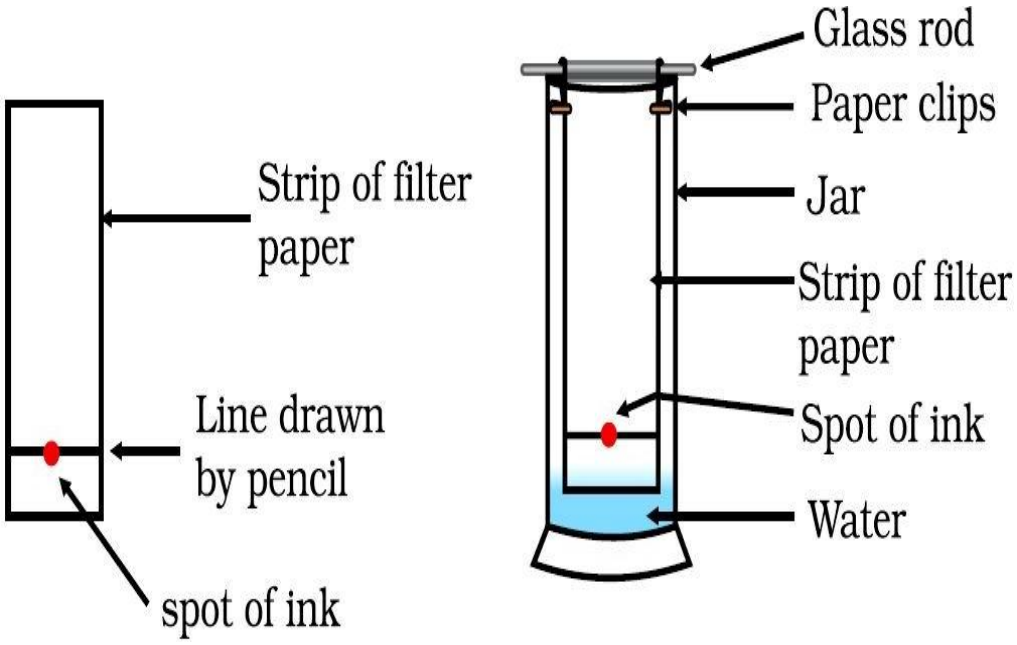
SEPARATION OF COMPONENTS OF MIXTURE

CHROMATOGRAPHY

Chromatography is a method of separation which works on the principle of travel speed of components of a mixture. This method is used for separating dyes and pigments from a mixture. Ink is the mixture of dyes of different colours.

There are many types of chromatography. The dyes from an ink can be separated using paper chromatography.

For this, a strip of filter paper is dipped in the ink. Particles of dye start rising on filter paper; along with water. Different dyes rise with different speed because of different types of solubility in water and go up to certain heights.

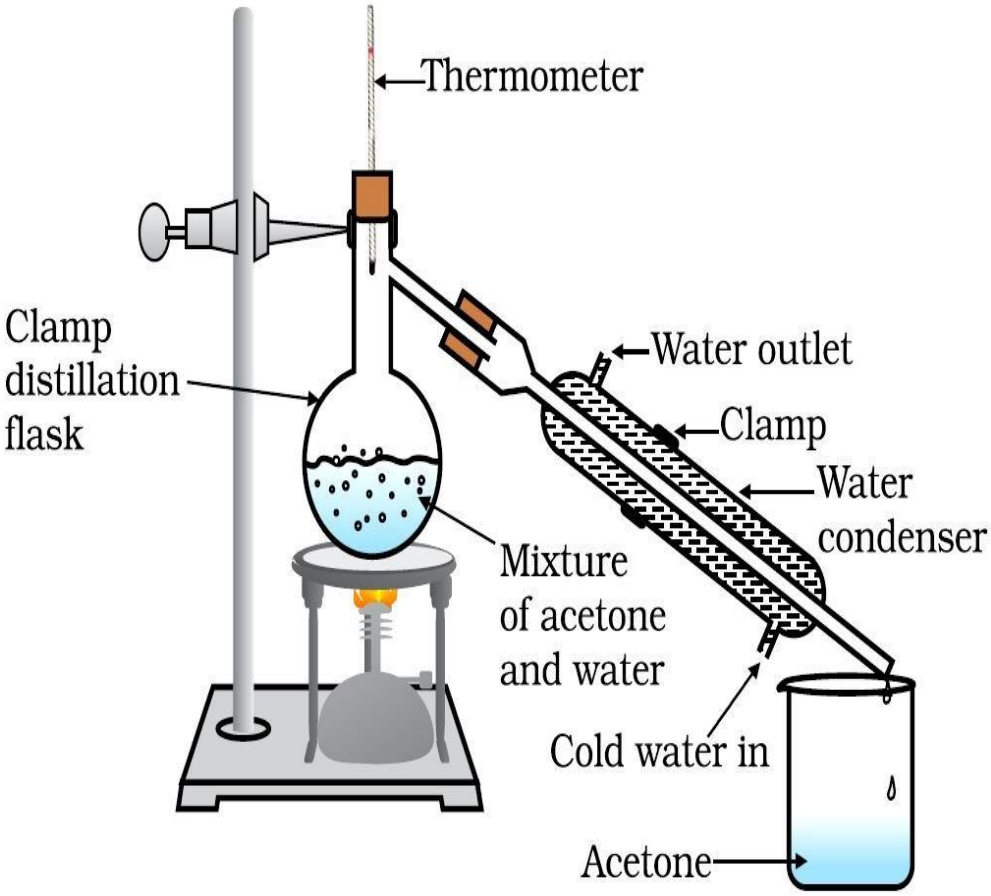


Application of chromatography -

- In the separation of colours from a dyes.
- In the separation of pigments from natural colours.
- In the separation of drugs from blood for pathological tests.

DISTILLATION

The process of distillation is used to separate two miscible liquids. The technique



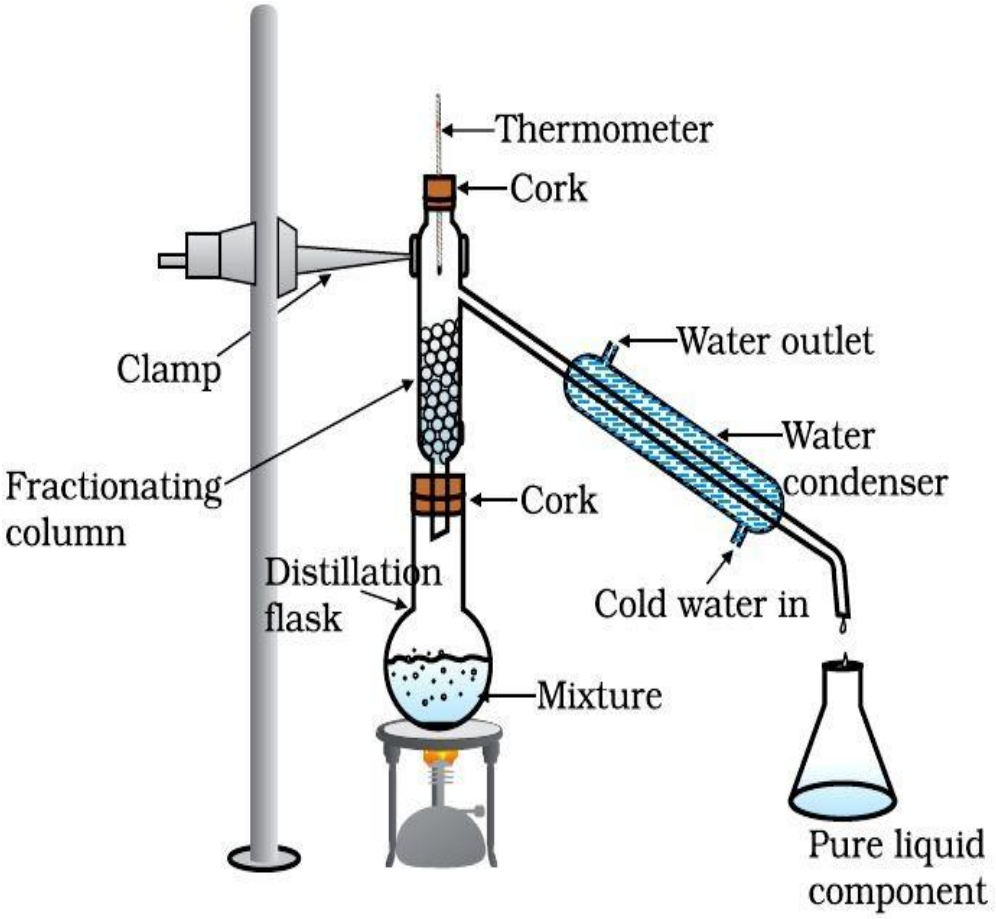
of distillation is based on the difference in boiling points of components of mixture of miscible liquids. Distillation is to separate the liquids which do not decompose even upto their boiling points and should boil at more than 25^0C.

In the process of distillation, the mixture is heated after keeping in a retort or distillation flask. The liquid which boils at lower temperature is vaporized at lower temperature. The vapour so obtained is passed through a tube and gets condensed in a separate container; leaving liquid with higher boiling point in the retort or distillation flask.

Distillation is used to separate the components of the mixture of two miscible liquids that boils without decomposition and have sufficient difference in their boiling points.

The process of distillation is used to purify many liquids, such as water.

FRACTIONAL DISTILLATION



Fractional distillation is the process of separation of components of mixture into parts or fraction on the basis of fractional differences in their boiling points.

Fractional distillation is done when the difference in boiling points of the components of miscible liquids is less than 25^0C. In the process of fractional distillation, a fractional column is used along with retort or distillation flask.

Fractional column is a tube which contains glass beads, which facilitate surface for the vapour to cool and condense repeatedly.

Example – Ethanol and water are separated from their mixture using fractional distillation. The boiling point of water is 100^0C while the boiling point of ethanol is 78.4^0C. Since the difference of their boiling point is less than 25^0C, thus they are separated using fractional distillation.

Some of the Applications of Fractional Distillation:

- In petroleum refineries, petrochemical and chemical plants, natural gas processing and cryogenic air separation plants.
- In oil refineries to separate crude oil into useful substances (or fractions).
- In the process of organic juice.
- In the separation of oxygen, liquid nitrogen and argon from air.

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