

CHEMISTRY



Separation of Liquid Mixtures

Separation of Two Miscible Liquids

Distillation

PRINCIPLE: This method is used for the separation of components of a mixture containing two miscible liquids which boil without decomposition and have a sufficient difference in their boiling points.

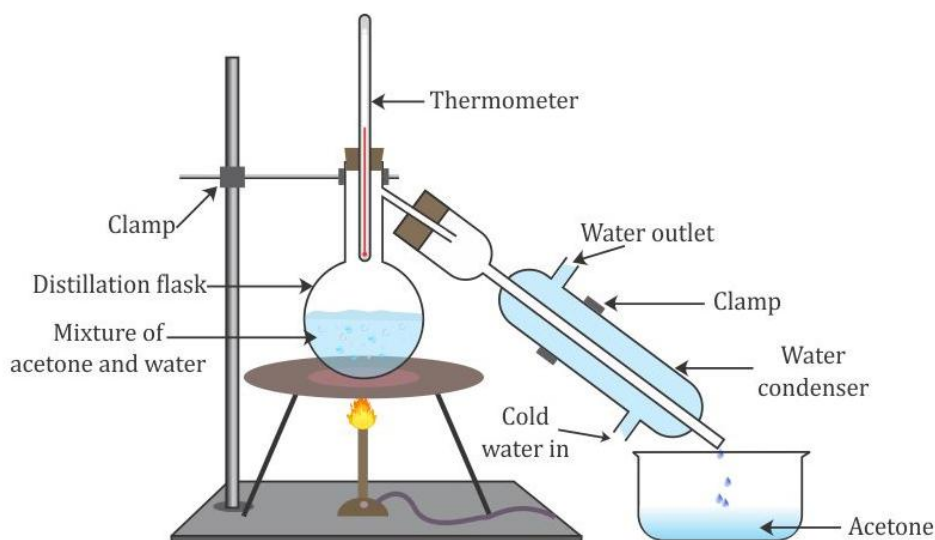
TECHNIQUE: Take the mixture in a distillation flask and fit in the thermometer. Arrange the apparatus as shown in the given figure.

Heat the mixture slowly, keeping a close watch on the thermometer.

The liquid with a low boiling point will vaporise and condense in the condenser and can be collected from the condenser outlet.

The liquid with a higher boiling point will be left behind in the distillation flask.

DIAGRAM:



EXAMPLE: Separation of a mixture of acetone and water.

Fractional Distillation

PRINCIPLE: This method is used for the separation of a mixture containing two miscible liquids, for which the difference in their boiling points is less than 25°C .

TECHNIQUE: The mixture is kept in a distillation flask attached with a fractionating column, having glass beads. The flask is then carefully heated.

The mixture first evaporates and later condenses. The glass beads present in the fractional column provide a larger surface area for the vapours to cool down.

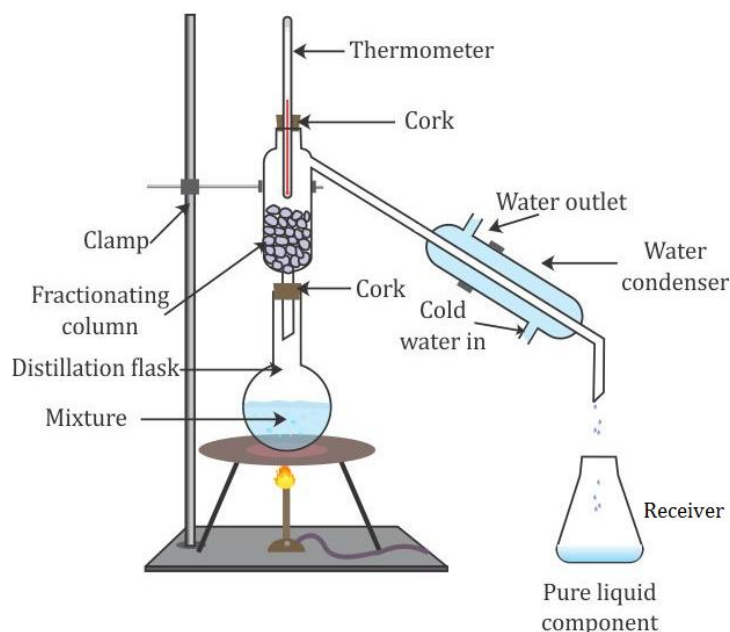
This technique is used to separate mixtures made up of two miscible liquids with a difference in their boiling points less than 25°C .

Separation of Compounds

The liquid with a higher boiling point remains in the distillation flask after condensation.

The liquid with a lower boiling point collects in the receiver after condensation.

DIAGRAM:



EXAMPLE: Separation of a mixture of benzene and toluene.

Separation of a mixture of water and carbon tetrachloride.

Crude oil can be separated into its fractions by fractional distillation.

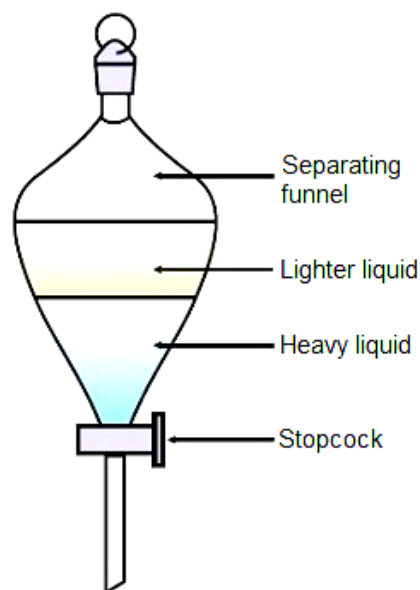
Separation of Two Immiscible Liquids

Separating funnel

PRINCIPLE: This method is based on the separation of a mixture containing two immiscible liquids, containing a heavy and a light liquid.

TECHNIQUE: The liquid-liquid mixture is added to the separating funnel and the funnel is allowed to stand for some time without any disturbance. The heavier immiscible liquid settles down and the lighter liquid floats above it. The two liquids can be removed separately with the help of the tap provided at the bottom of the funnel.

DIAGRAM:



EXAMPLE:

Separation of kerosene and water. Separation of oil and water.