

Distillation

Distillation is a method of **separation** of **substances** based on differences in their boiling point.

The concentration of alcohol by the application of heat to a fermented **liquid** solution is perhaps the oldest form of distillation.

However, the technique is now widely used for a variety of liquids in the **chemical industry**, in the production of petroleum products, and among other fields.

The liquid solution evaporates, so that the vapour has a composition determined by the **chemical properties** of the solution.

Distillation is possible when the vapour has a higher proportion of the given component than the solution.

This is caused because the given component has a boiling point lower than the other components.

However, interactions between the components of the solution can create properties unique to the solution.

Because of the nature of the process, it is theoretically impossible to purify completely the components using distillation.

This is comparable to dilution, which never reaches purity. If ultra-pure products are the goal, then further chemical separation must be used.

You can see the equipment of the distillation in the picture below.

The process of separation:

- firstly the vapours given off by the heated solution may consist of two liquids with significantly different boiling points;
- thus, the vapour that is given off is in the vast majority of one or the other liquid, which after condensation and collection effects the separation.

By extracting products that are liquid at different heights up the column, it is possible to extract liquids that have different boiling points.

A greater distance applied on the condenser, over the gradient temperature, will lead to an easier and complete separation.

Distillation was developed into its modern form with the invention of the alembic by Arab-Yemeni (Iranian born) alchemist Jabir Ibn Hawan c. 800; he is also credited with the invention of numerous other chemical apparatus and processes that are still in use today.

(Adapted from Wikipedia)

Distillation equipment

