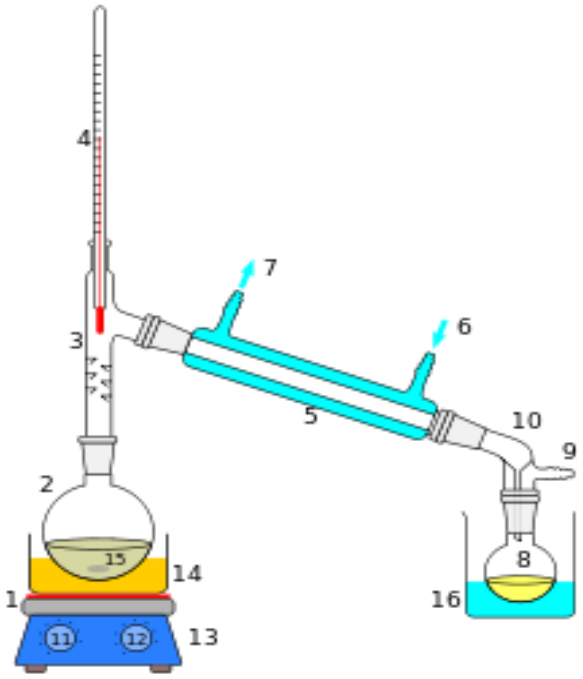
Distillation, or classical distillation, is the process of separating the components or substances from a liquid mixture by using selective boiling and condensation. Dry distillation is the heating of solid materials to produce gaseous products (which may condense into liquids or solids). Dry distillation may involve chemical changes such as destructive distillation or cracking and is not discussed under this article. Distillation may result in essentially complete separation (nearly pure components), or it may be a partial separation that increases the concentration of selected components in the mixture. In either case, the process exploits differences in the relative volatility of the mixture's components. In industrial applications, distillation is a unit operation of practically universal importance, but it is a physical separation process, not a chemical reaction.



Laboratory display of distillation: **1:** A heat source **2:** Round bottomed flask **3:** Still head **4:** Thermometer/Boiling point temperature **5:** Condenser **6:** Cooling water in **7:** Cooling water out **8:** Distillate/receiving flask **9:** Vacuum/gas inlet **10:** Still receiver **11:** Heat control **12:** Stirrer speed control **13:** Stirrer/heat plate **14:** Heating (Oil/sand) bath **15:** Stirring mechanism (not shown) e.g. boiling chips or mechanical stirrer **16:** Cooling bath.

Distillation has many applications. For example:

- The distillation of fermented products produces distilled beverages with a high alcohol content, or separates other fermentation products of commercial value.
- Distillation is an effective and traditional method of desalination.
- In the petroleum industry, oil stabilization is a form of partial distillation that reduces the vapor pressure of crude oil, thereby making it safe for storage and transport as well as reducing the atmospheric emissions of volatile hydrocarbons. In midstream operations at oil refineries, fractional distillation is a major class of operation for transforming crude oil into fuels and chemical feed stocks.
- Cryogenic distillation leads to the separation of air into its components – notably oxygen, nitrogen, and argon – for industrial use.
- In the chemical industry, large amounts of crude liquid products of chemical synthesis are distilled to separate them, either from other products, from impurities, or from unreacted starting materials.

An installation used for distillation, especially of distilled beverages, is a distillery. The distillation equipment itself is a still