

Distillation

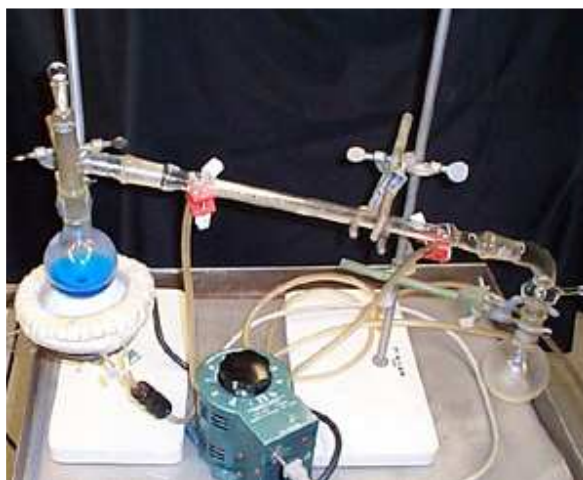
Description: A distillation apparatus is setup to demonstrate separations of liquids.

Materials:

Distillation apparatus (Dab 114)	H ₂ O/CH ₃ OH
Coffee	H ₂ O/food coloring

Procedure:

Set up distillation apparatus as shown below. If coffee or H₂O/food coloring is used, distill off water. Water from coffee distillate will retain coffee aroma and therefore a discussion on volatile “aromatic” compounds can be given. If a H₂O/CH₃OH mixture is used, distill off CH₃OH. Since both liquids are colorless, indicate the distilled liquid is indeed CH₃OH by igniting with a match. As methanol flames are difficult to see, ignite a new match using the flames from the CH₃OH fire.



Discussion: Isolating a single component from a mixture in the described manner is an example of fractional distillation. Distillation involves a process in which a mixture is partially vaporized and then condensed in order to obtain a liquid containing only one component of the original mixture.

Safety: Care should be taken to avoid burns from the apparatus. Make sure glassware is cool before touching. Methanol burns with a pale blue flame and care should be taken to avoid burns from the flames. Methanol vapors are toxic and this demonstration should be performed in a well ventilated area.

Disposal: Solutions can be poured down the drain. If methanol is used, place the methanol distillate in an appropriate waste container.

References:

Shakhashiri, B. Z. In *Chemical Demonstrations: A Handbook for Teachers of Chemistry*; The University of Wisconsin Press: 1989; Vol. 3, p 258-262.

Clarke, R. J. *Dev. Food Science* **1986**, 3B, 1.

Video:

<http://www.youtube.com/watch?v=0x2-8dedmE4&feature=fv>