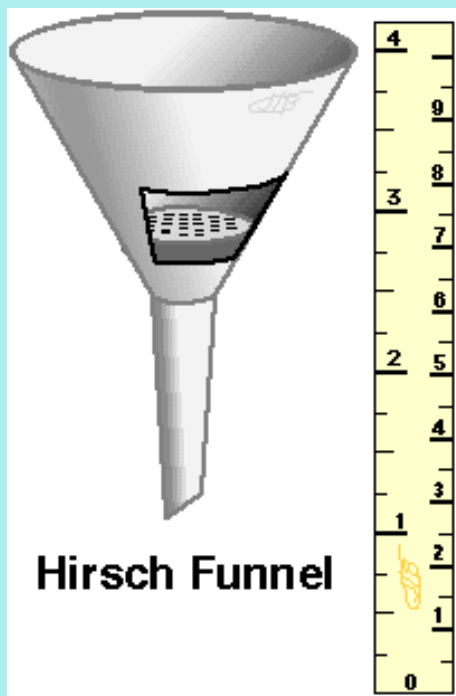


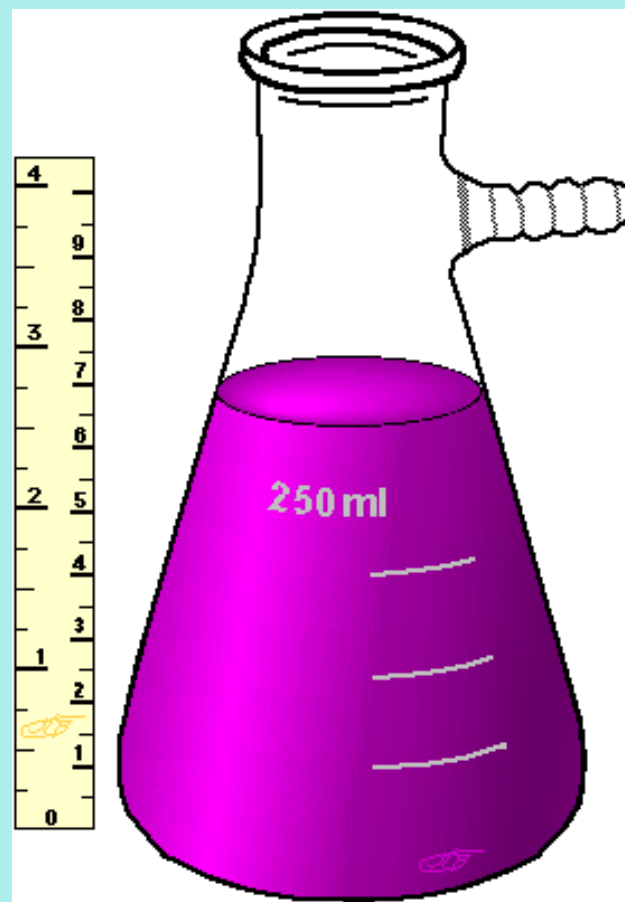
## Moving apart—separating substances

**TABLE 1.2 Separation methods and the properties they depend upon**

Separation method	Property used in the separation
sieving	particle size
vaporisation (evaporation or boiling)	the liquid has a much lower boiling point than the solid
distillation	big difference in boiling points
fractional distillation	significant but small difference in boiling points
filtration	one substance a solid, the other a liquid or solution
adding a solvent, then filtration	one substance is soluble in the chosen solvent while the others are insoluble
using a separating funnel	components are immiscible liquids



Hirsch Funnel



Filtering Flask

<http://chemserv.venturacollege.edu/doliver3/glassware/Lab-index.htm>

## Filtering Details PDF



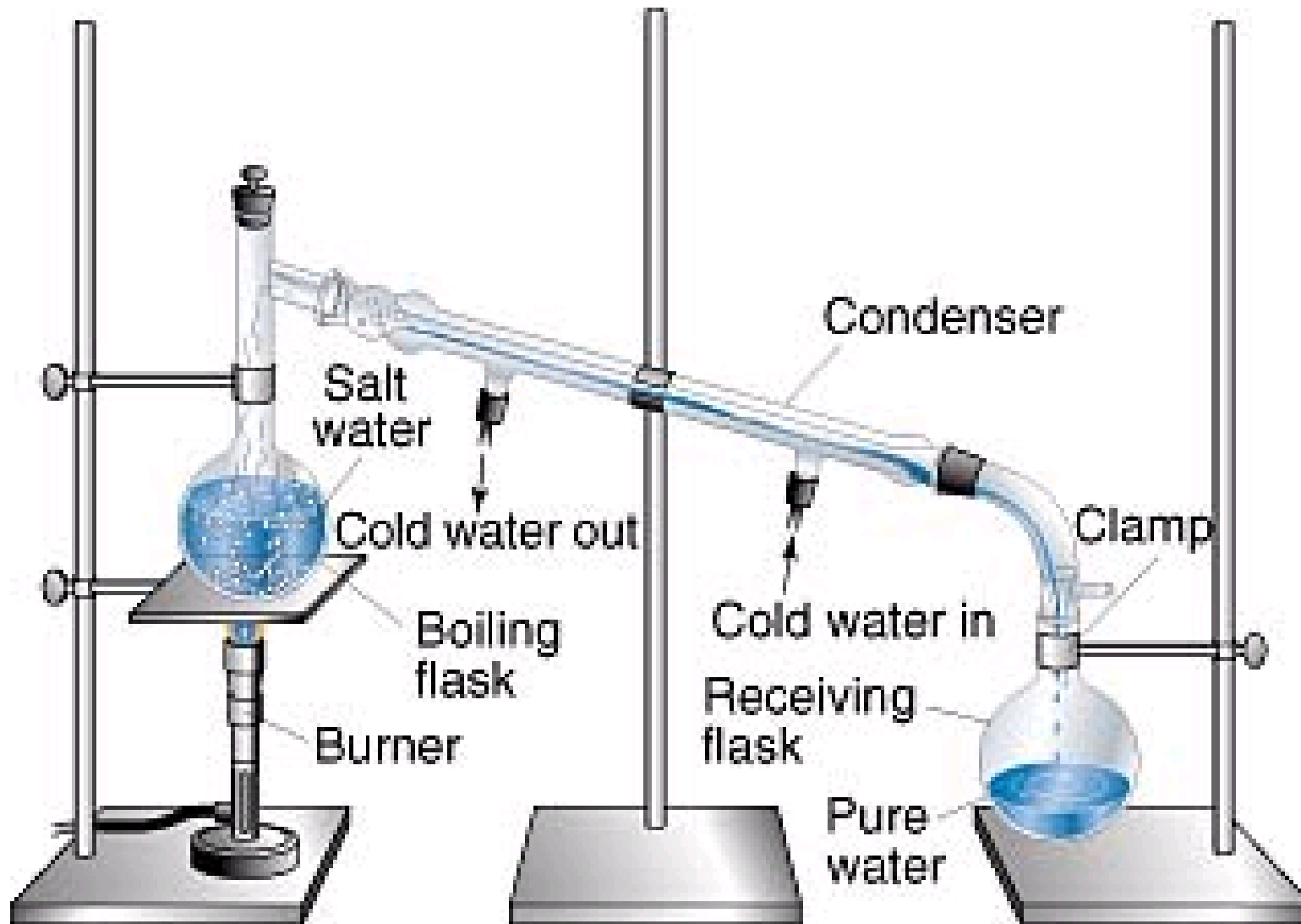
# Simple distillation

Simple distillation is designed to evaporate a volatile liquid from a solution of non-volatile substances; the vapour is then condensed in the water condenser and collected in the receiver.

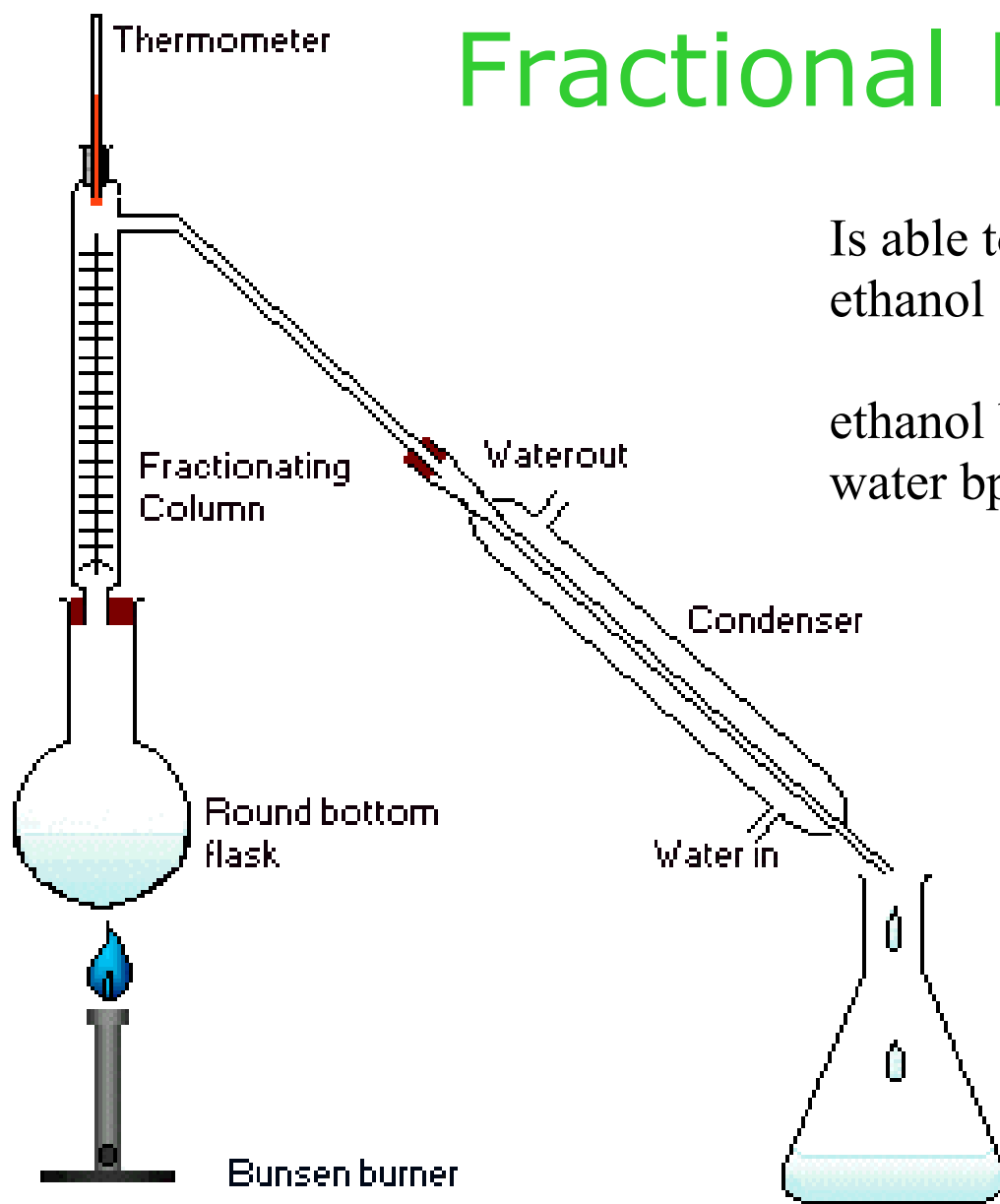
The apparatus consists of **round-bottomed distilling flask** bearing a **stillhead** connected to a **water condenser** (Liebig condenser). This is attached via a **vented delivery bend** to the **receiver**, also a round-bottomed flask. The stillhead has a **thermometer adapter** with a **thermometer**.

## Notes:

- the bulb of the thermometer is opposite the exit to the condenser. You want the temperature of the exit vapours since it is these that will condense.
- the delivery bend is vented so that when the apparatus is heated the joints aren't pushed apart by expanding gas. Never draw a closed apparatus.
- water goes in at the bottom of the condenser jacket and out at the top.
- note the structure of the condenser - the water jacket is separate from the tube down the middle!



# Fractional Distillation



Is able to separate ethanol from ethanol solutions

ethanol bpt = 78 C  
water bpt = 100 C

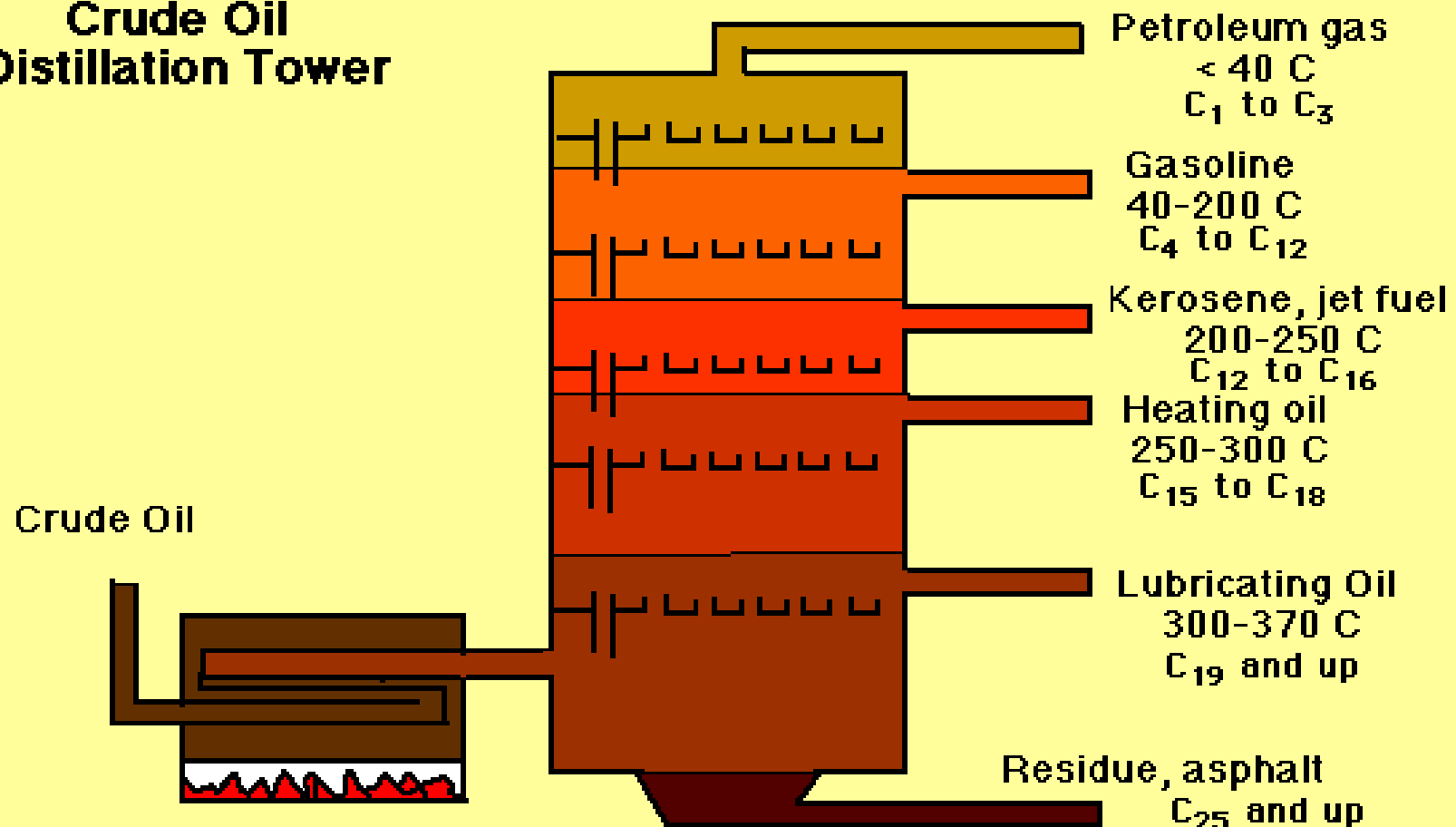


Distillation  
on  
an industrial scale

Crude Oil

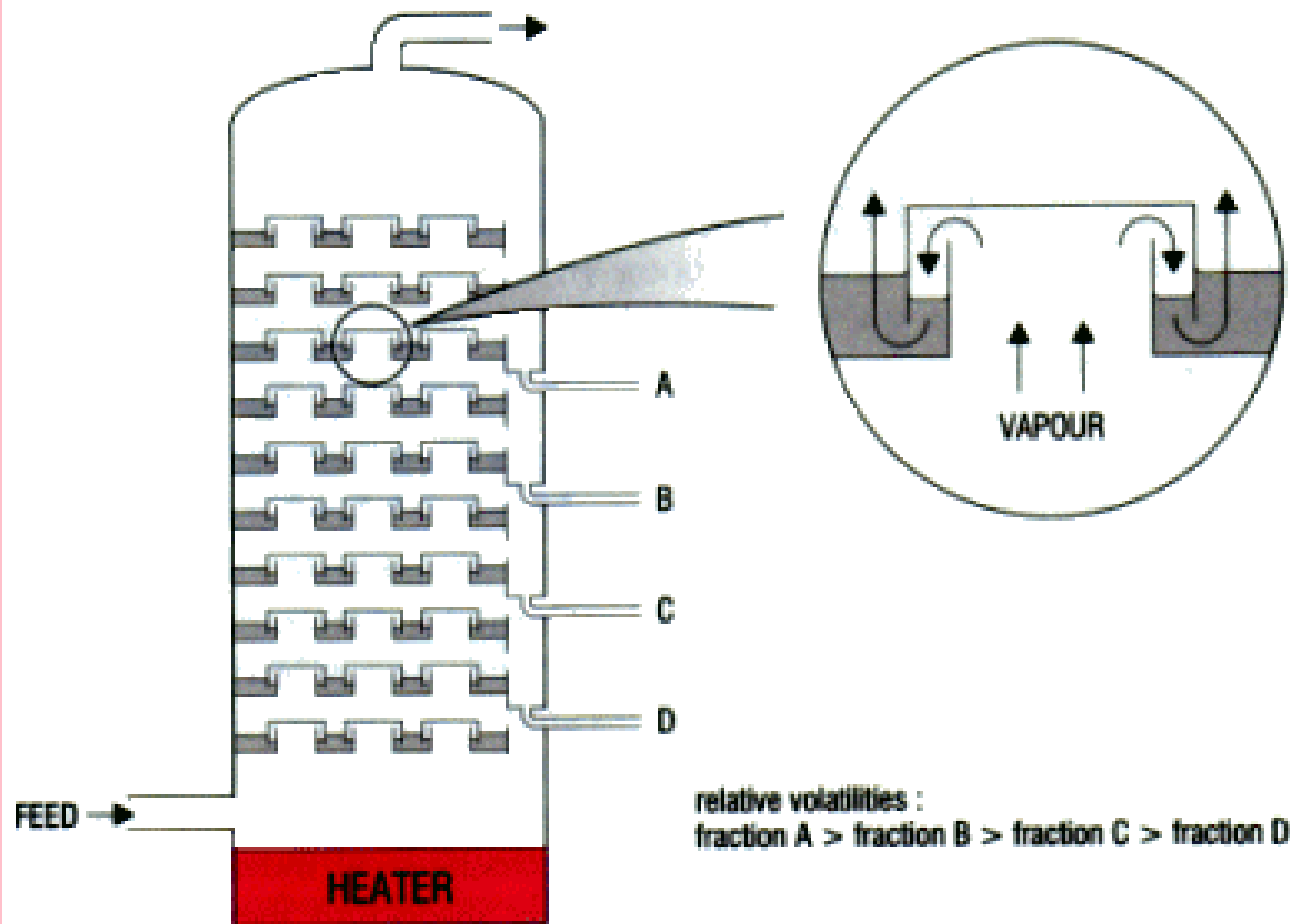
# How this works

## Crude Oil Distillation Tower



C. Ophardt c.1998





# Details of Fractional Distillation PDF

## A Separating Funnel



These are used for separating immiscible liquids.

Liquids which form distinct layers and do not mix

In use you may need to turn upside down in order to release VP.

If not you may blow the stopper?

Your teacher will explain

Fractional Distillation of Crude Oil.pdf