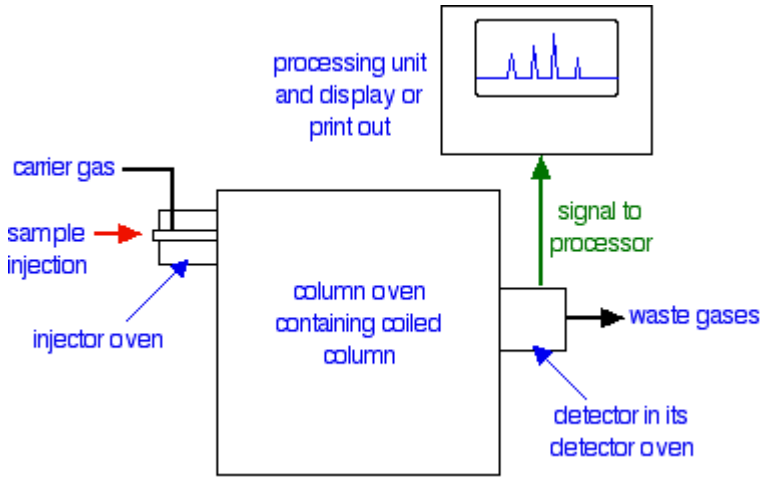
GAS-LIQUID CHROMATOGRAPHY

1. The diagram taken from the Chemguide page shows a flow scheme for gas-liquid chromatography.



a) Suggest a possible carrier gas.

b) What is the purpose of the injector oven?

c) What is the stationary phase in gas-liquid chromatography?

d) Outline the various things that might happen to a compound as it is carried into the chromatography column by the carrier gas.

e) A substance is said to partition itself between the carrier gas and the stationary phase. What does that mean?

f) How is the retention time of a component of a mixture measured?

g) The following factors affect the retention time of a component in a mixture. Explain briefly what the effect of each is.

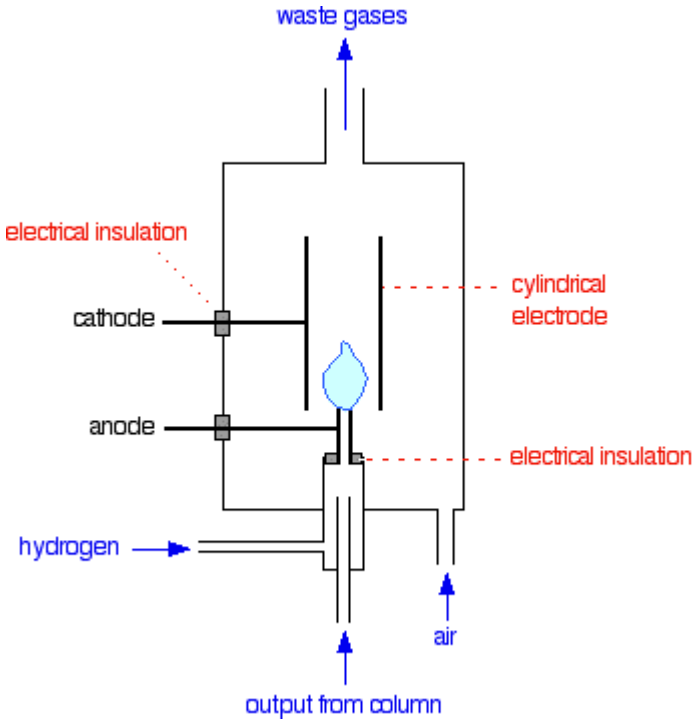
(i) The boiling point of the compound.

(ii) The solubility of the compound in the stationary phase.

(iii) The temperature of the column.

h) The temperature of the column can be increased in a controlled way while the sample is passing through the column. What is the point of doing that?

2. One form of detector is a flame ionisation detector. This diagram from the Chemguide page shows what it looks like.

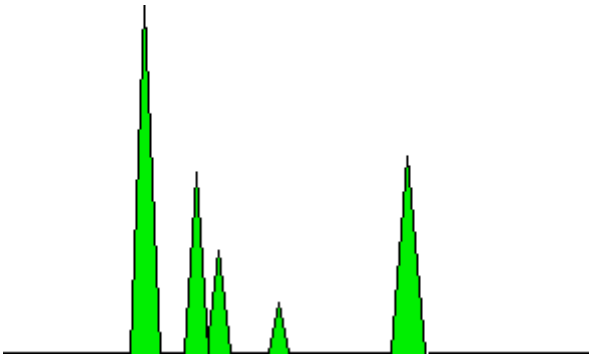


a) Explain how it works.

b) The detector is kept at a temperature hotter than the temperature of the column. Why?

c) It is often useful to divert some of the output from a chromatography column to a mass spectrometer to get a fragmentation pattern which can help you to identify what is coming out at that time. Why can't you do that if you use flame ionisation detection?

d) The output from the detector is recorded as a series of peaks. This simplified diagram from the Chemguide page shows the areas under the various peaks in green.



What information can you get from the areas under the peaks?