

Gas Chromatography

Mobile phase



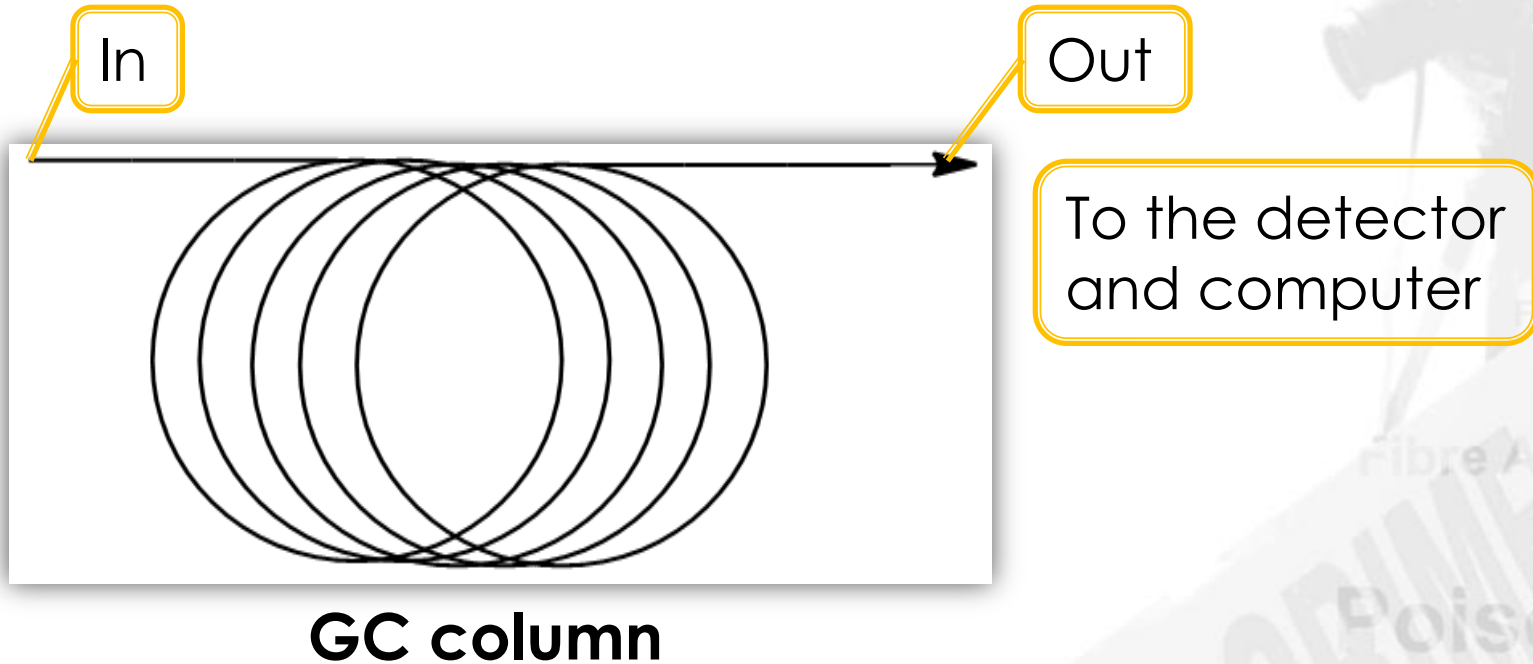
Carrier gas

Uses a column to contain the stationary phase



Coil of packed metal tube

Gas Chromatography



GC vs TLC

TLC



Measure distance moved by components in a fixed time



R_f

GC

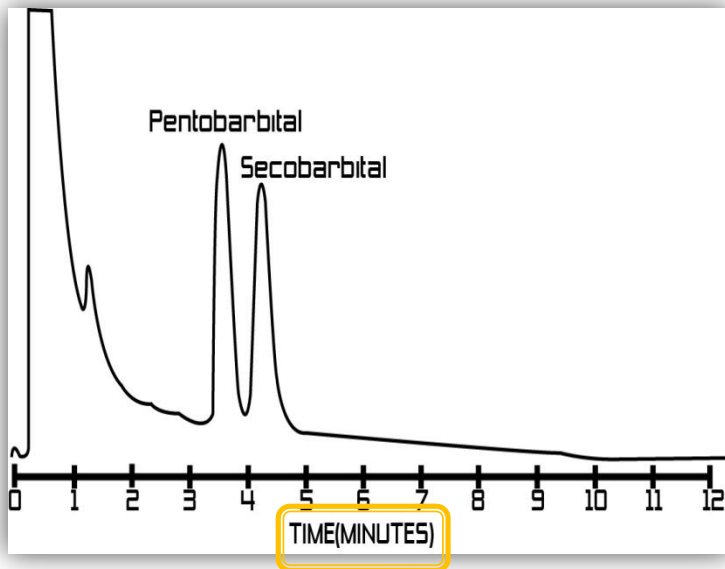


Measure time taken by components to move to the end of the column

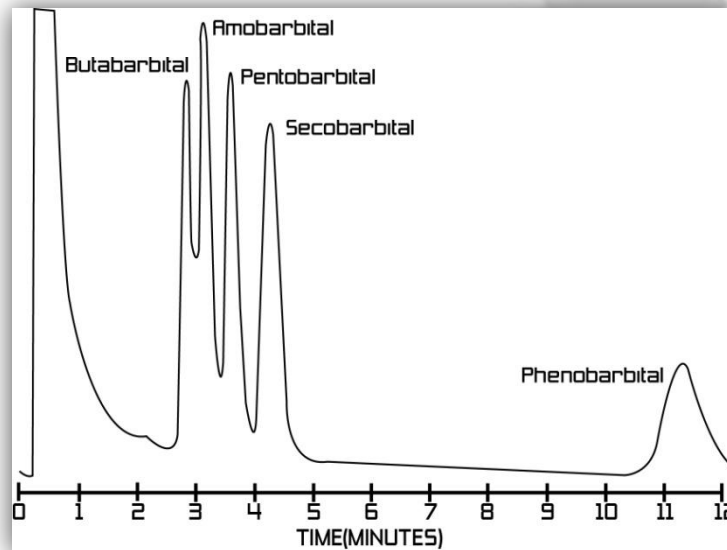


Retention time

GC Results

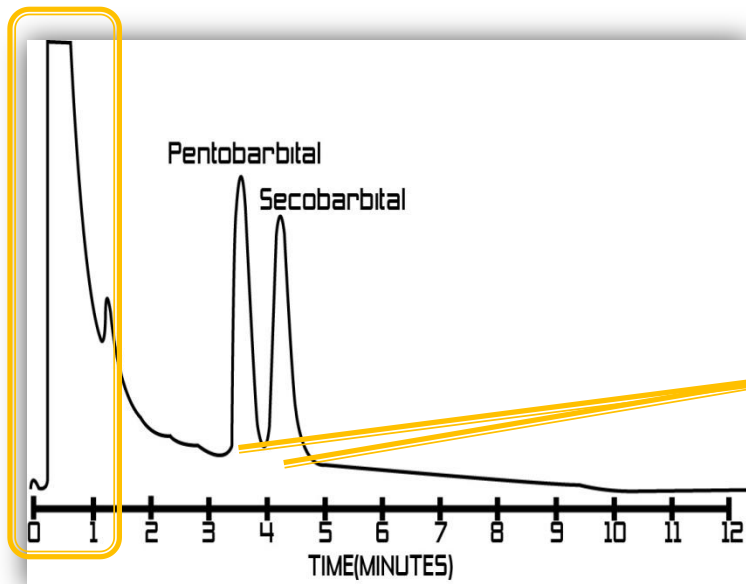


Unknown sample



Known standards

GC Results



Unknown sample

Solvent peak



Can be ignored

Area under peak



Proportional to the
amount of material

Gas Chromatography

- 1 Separate mixture into components
- 2 Measure amount of components present



Quantification

Types of Chromatography

- 1 Thin Layer Chromatography (TLC)
- 2 Gas Chromatography (GC)
- 3 High Performance Liquid Chromatography or High Pressure Liquid Chromatography (HPLC)

HPLC

Mobile phase



Liquid



Organic solvents or
aqueous solutions

Steel columns



High pressures

Why Use High Pressures?

Stationary phase densely packed in the column



High pressures



Get good flow rates



Steel columns to withstand pressures

HPLC

Similar to GC

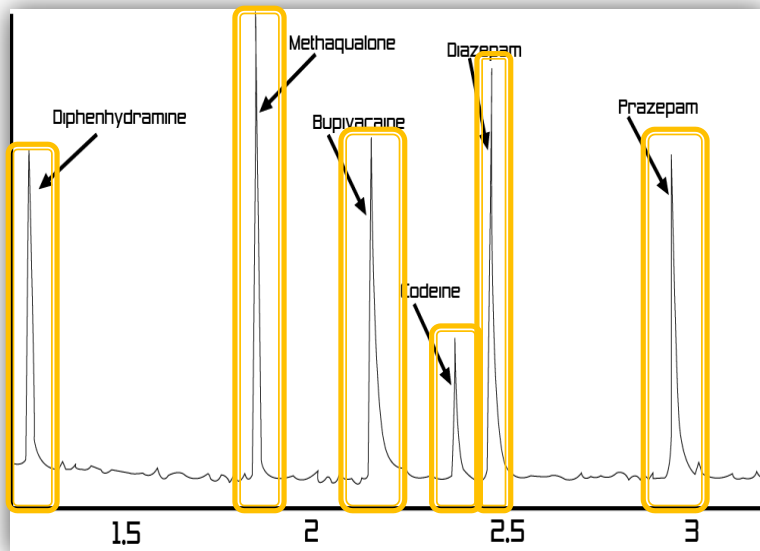


Measure time taken by components to move to the end of the column

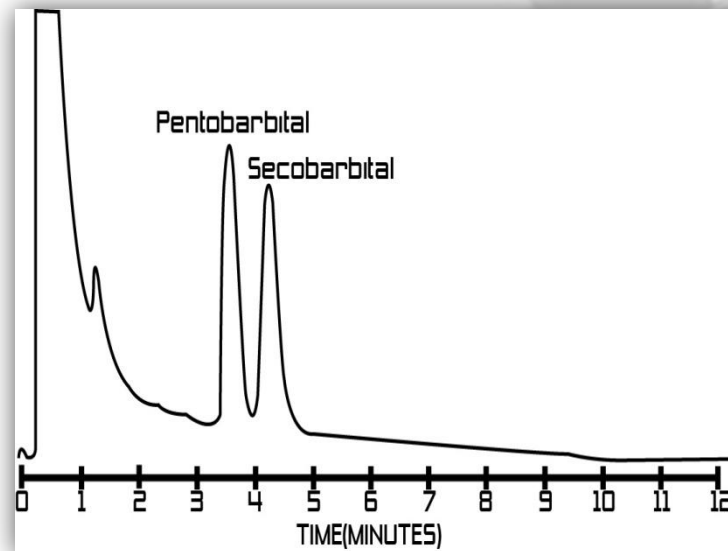


Measuring retention time

HPLC

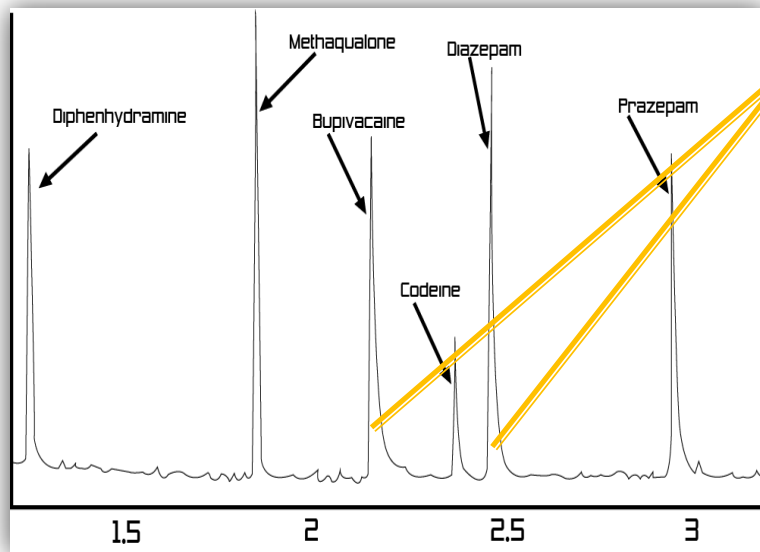


HPLC chromatogram



GC chromatogram

HPLC



Area under peak

Proportional to the
amount of material

HPLC chromatogram

HPLC vs GC

- 1 Efficient, highly selective, widely applicable
- 2 Small amounts of sample required
- 3 Non-destructive of the sample
- 4 Quantitative
- 5 High resolution

HPLC vs GC

GC



1

Simple

2

Inexpensive

3

Rapid

HPLC



1

Non-volatile samples

2

Samples that are thermally unstable