

Chromotrographic Techniques

HPLC

**Columns,
Pumps
Detectors
Theory**

GC

**Capillary column
Detectors, FID, Electron Capture
Injectors**

GC/MS

**Basic Theory
Modes; Scan vs SIM
Intpretation of Spectra**

Chromatography

1731 Universal Etymological dictionary- “
“separation by color” (colour)

Pliny the elder in ancient Rome employed a method for the detection of iron by applying a drop of solution to papyrus impregnated with extract of gall----> color change

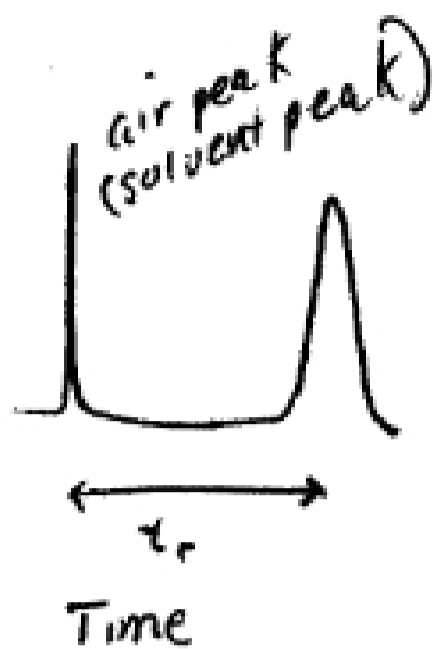
in the 1850s F. F. Runge a German dye chemist used capillary action to separate many inorganic cations by virtue of their different migration rates in solution through paper.

1903 M. S. Tswett, a Russian botanist working in Warsaw separated on a column various plant pigments

inlet-----> separation ----> detection

Some Chromatography Terms

- Retention time, t_r ,



- Retention volume = Volume of fluid that passes through a column to elute a compound
 V_r

$$V_r = t_r \times F_c$$

where F_c = flow rate

- The retention volume for an air peak (or solvent peak) which is not retained is, V_m

- Assume that the elution of a peak is related to the mass or the volume of the stationary phase, V_s

and a constant, K , which is unique to each compound

stationary phase ← stationary phase

$$V_r = V_m + K V_s$$

$$K V_s = V_r - V_m = \text{adjusted retention volume, } V_r'$$