Organic Pharmaceutical Chemistry IV

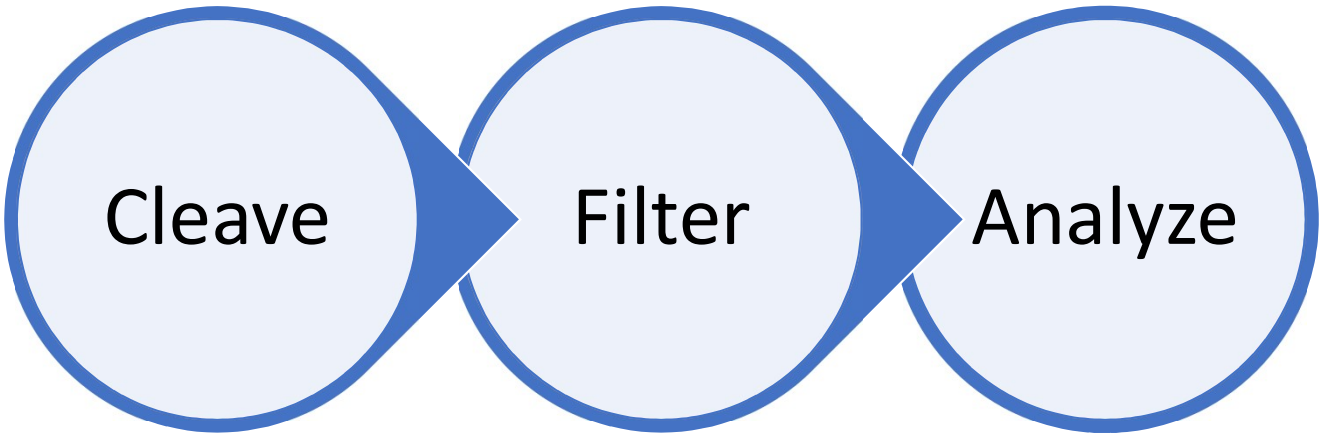
Fifth Stage

Lecture 14

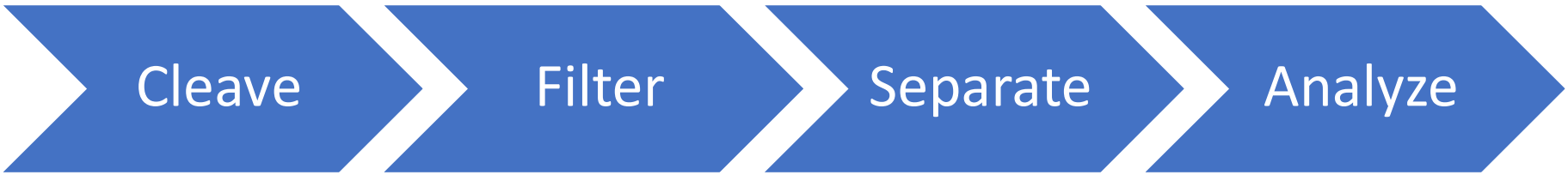
Detection, Purification, and Analysis

- The analysis should be nondestructive
- The methods must be suitable for rapid, parallel analysis
- The quantities to be analyzed are very small

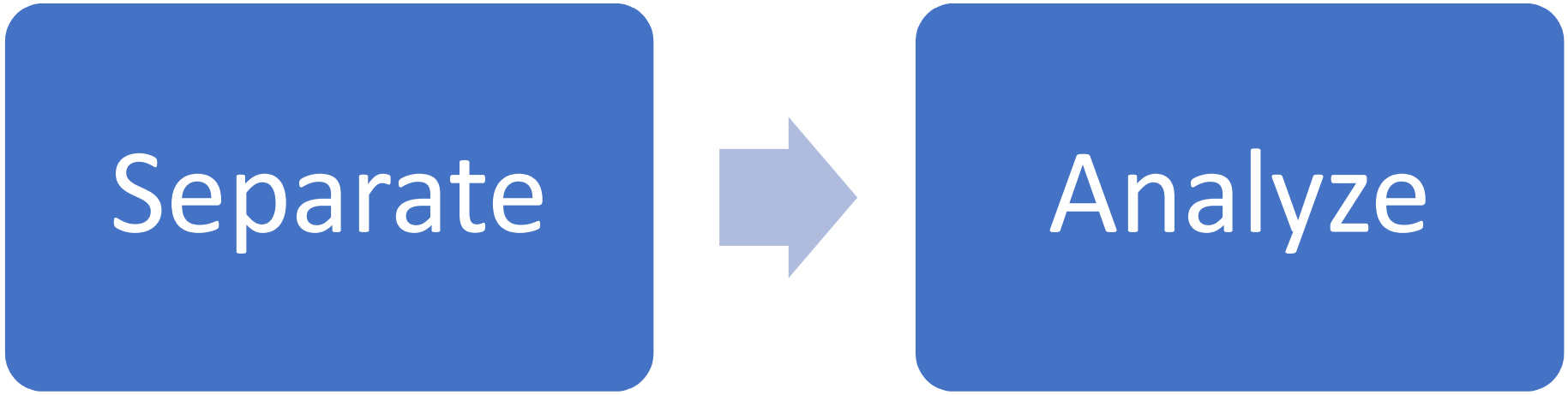
Solid-Phase, One-Compound, Chemistry



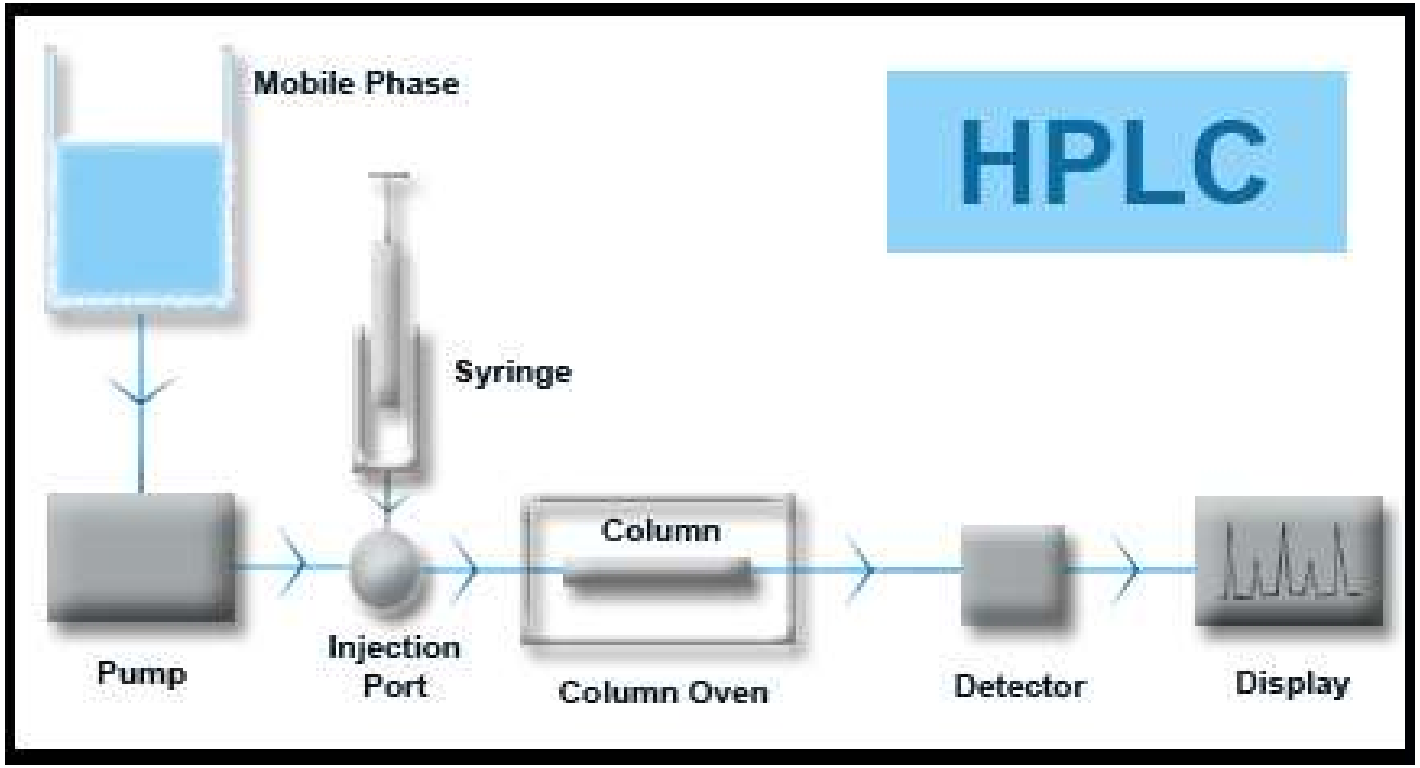
Solid-Phase, Mixture, Chemistry



Solution-Phase Chemistry



High Performance Liquid Chromatography

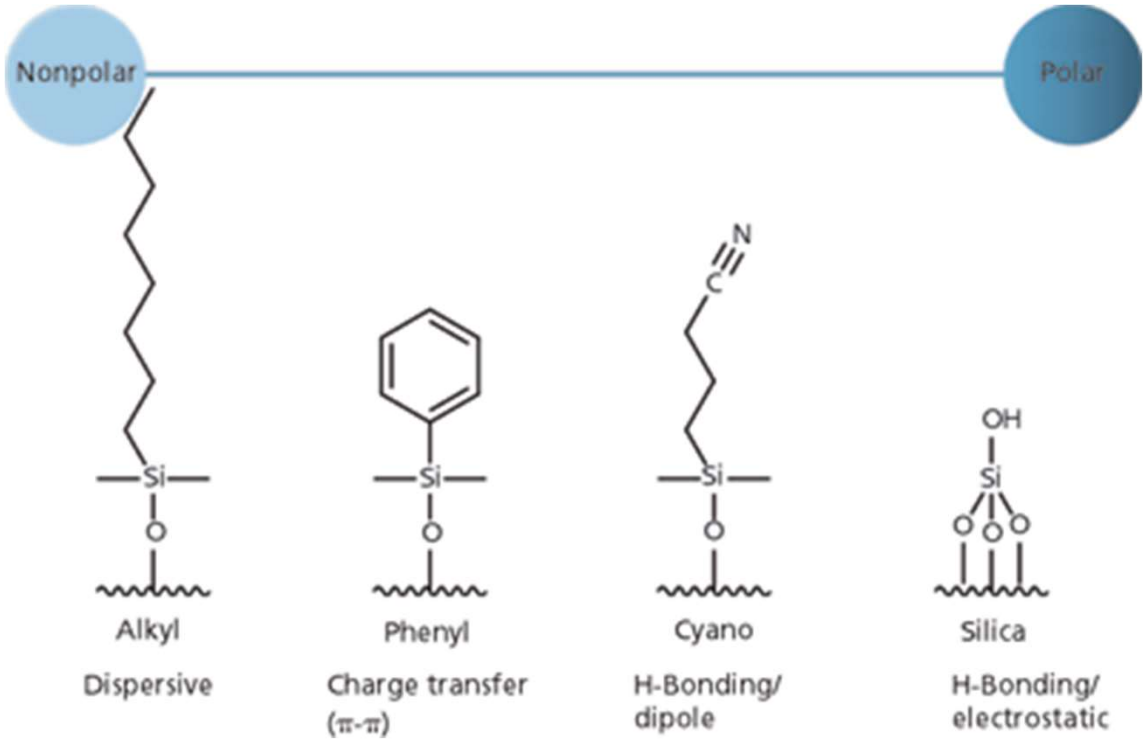


HPLC

- Mobile phase
  - Water
  - Acetone
  - Acetonitrile
  - Ethyl Acetate
  - Methanol
  - Ethanol
  - Hexane

HPLC

Stationary phase



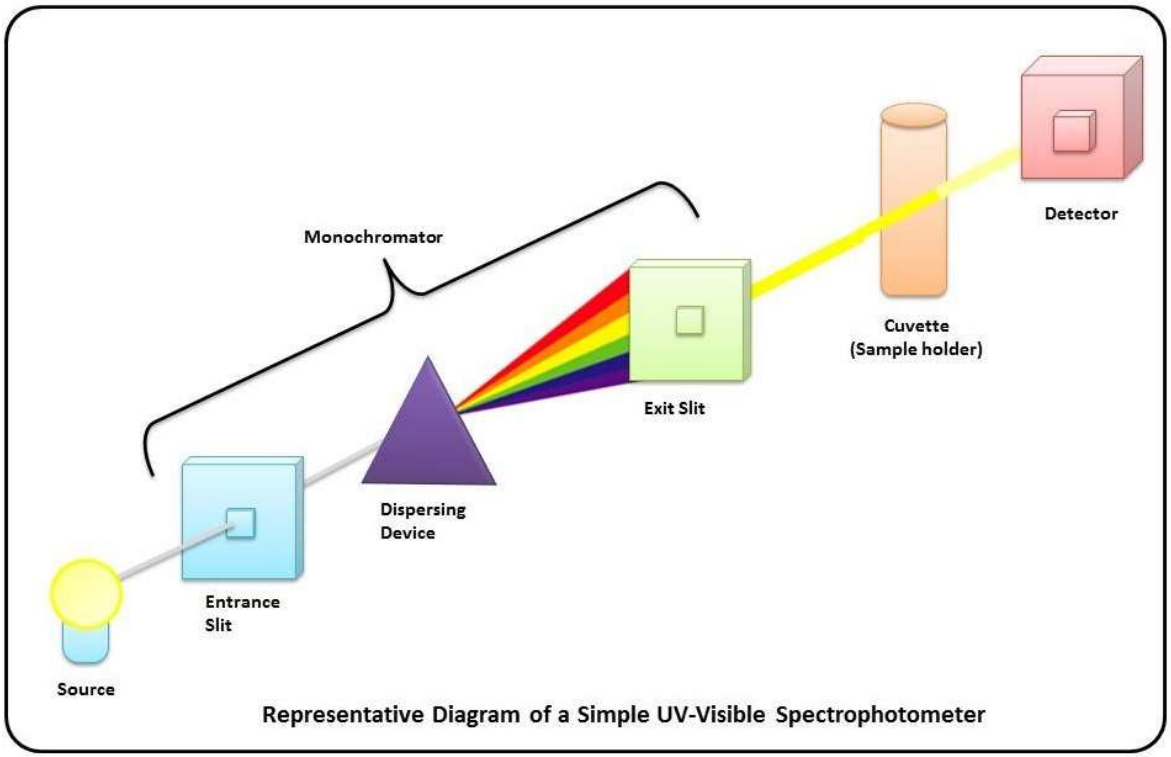
HPLC

- Detector
  - UV absorption
  - Fluorescence
  - Refractive index

Supercritical Fluid Chromatography (SFC)

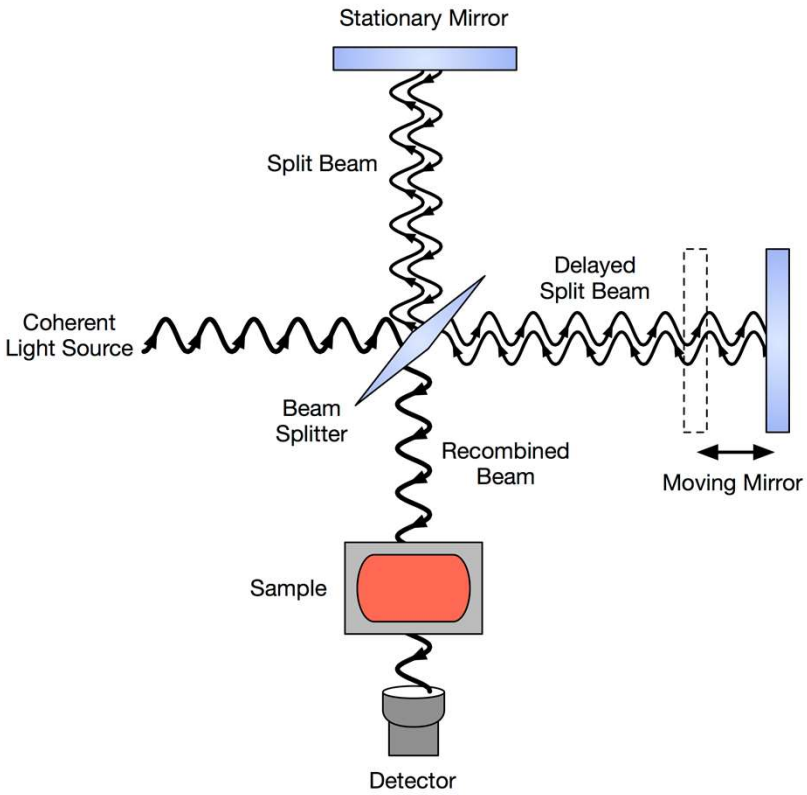
- The mobile phase is a pressurized gas (Carbon Dioxide)
  - Evaporate from the output
  - Faster than regular HPLC
  - Uses less solvent as compared to HPLC
  - ➢ Not everything separate well with SFC

Ultra-Violet (UV)

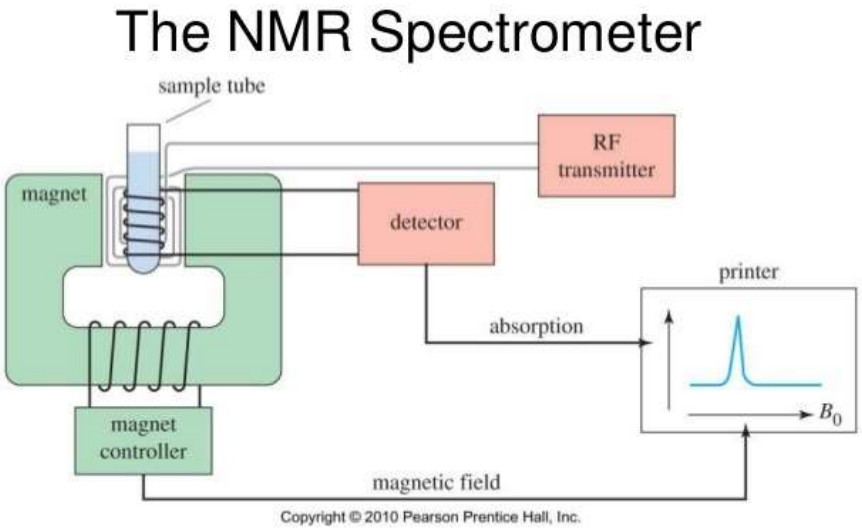


Representative Diagram of a Simple UV-Visible Spectrophotometer

Fourier Transform Infrared (FTIR)



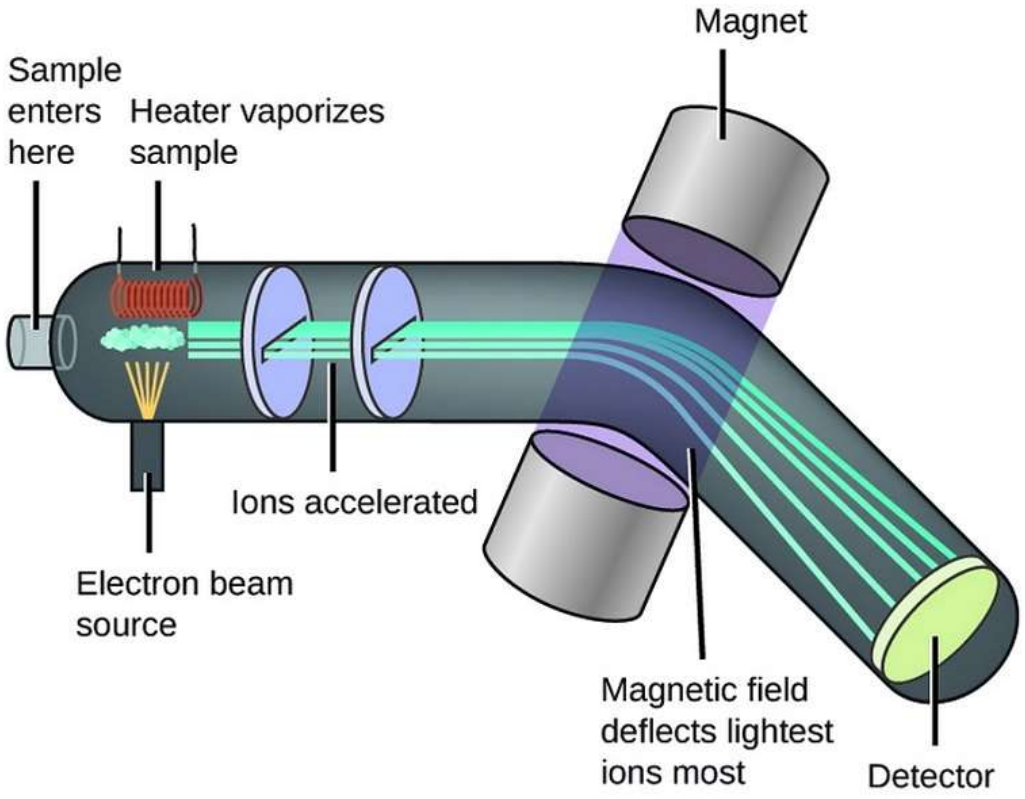
Nuclear Magnetic Resonance (NMR)



NMR

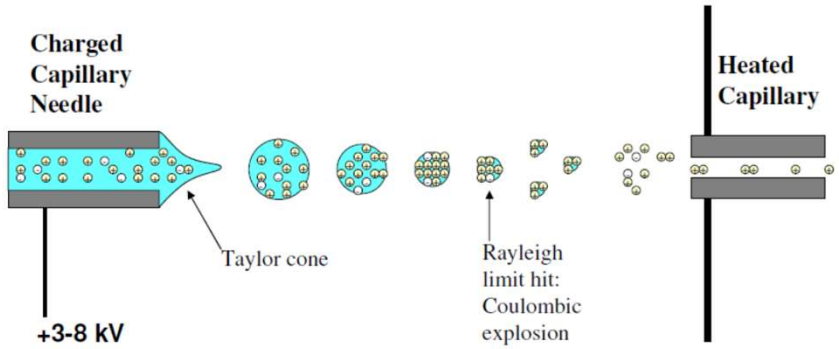
- Magic angle spinning NMR
- Nanoprobes
- Two-dimensional NMR
- HPLC-NMR
- CE-NMR
- SAR-NMR

Mass Spectrometry



Electrospray Ionization (ESI)

Mechanism of Electrospray Ionization (ESI)



Matrix-Assisted Laser Desorption/Ionization Time Of Flight (MALDI-TOF)