High Performance Liquid Chromatography (HPLC)

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Objectives:

1. Identify the HPLC.
2. Types of HPLC.
3. Factors affect on the HPLC.
4. Application of HPLC.
5. Advantages and Disadvantages of HPLC.

HPLC

High-performance liquid chromatography (**HPLC**), formerly referred to (**high-pressure liquid chromatography**), is a technique in analytical chemistry used to separate, identify, and quantify each component in a mixture.

HPLC Instrument Components

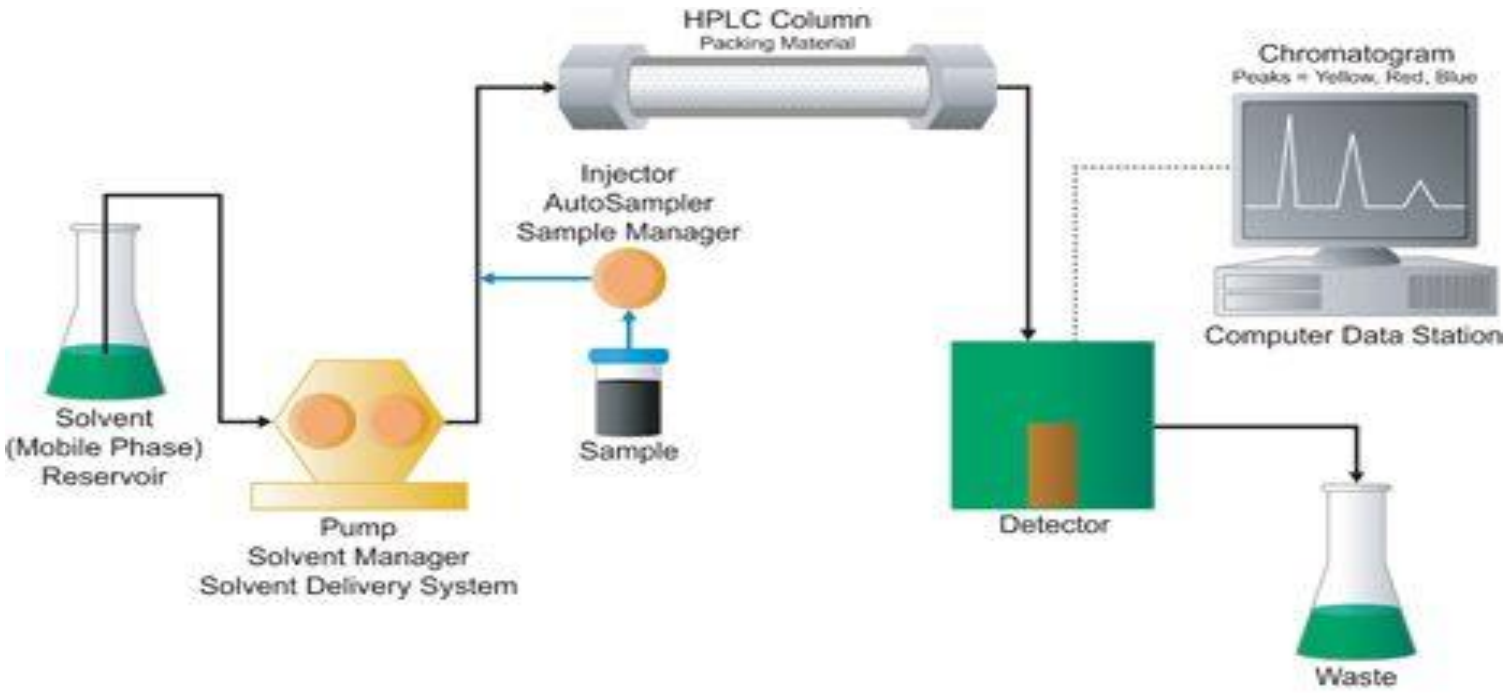
Pump

Injector

Separation column

Detector

HPLC


HPLC Column
Packing Material
Chromatogram
Peaks = Yellow, Red, Blue
Injector
AutoSampler
Sample Manager
Computer Data Station
Solvent
(Mobile Phase)
Reservoir
Sample
Pump
Solvent Manager
Solvent Delivery System
Detector
Waste

Types of HPLC

- ✓ Adsorption (liquid-solid) chromatography.
- ✓ Partition (liquid-liquid) chromatography.
- ✓ Ion exchange chromatography.
- ✓ Size exclusion chromatography.

HPLC Modes:

Depends on the polarity of the solvent and the stationary phase, there are two variants in use in HPLC:

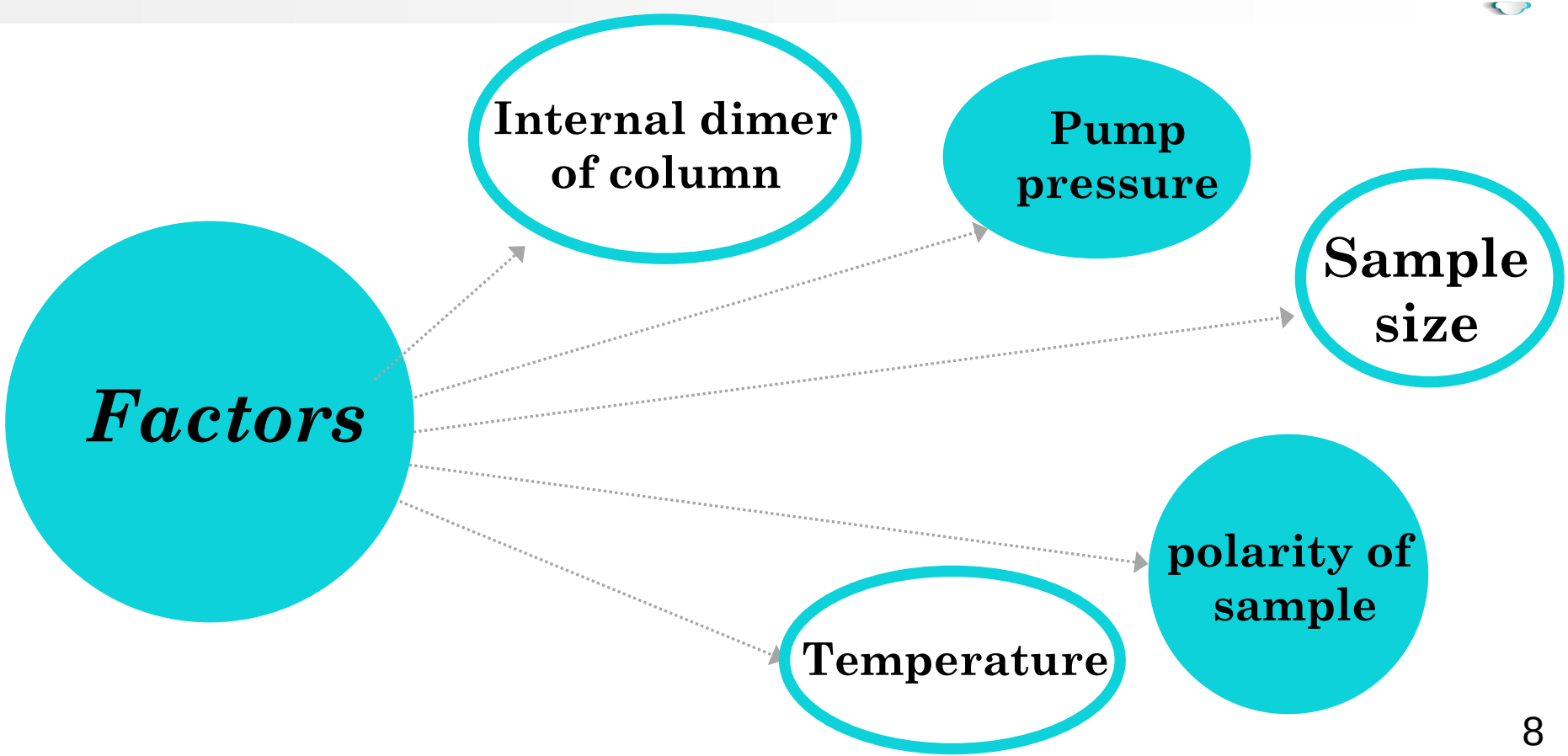
Normal phase mode:

- Stationary phase: high polarity
- Mobile phase: low polarity

Reversed phase mode:

- Stationary phase: low polarity
- Mobile phase: high polarity

Factors affect on the HPLC



Application of HPLC

- Pharmaceuticals industry.
- Analysis of natural contaminations.
- Forensic tests.
- Clinical tests.
- Food and essence manufactures.

Advantages and Disadvantages of (HPLC).

Advantages

- High separation capacity, enabling the batch analysis of multiple components.
- High sensitivity.
- Low sample consumption.
- Easy preparative separation and purification of samples.

Disadvantages

- Cost and Complexity.
- Sensitivity and Resolution.

Summary

- HPLC is a technique used to identify the component of mixture.
- It have a four main components:

Pump, injector, separation column, and detector.

- HPLC have four types and two modes

(normal, reversal).

- They are many factors that affect on the HPLC.
- Also, we have many application of it, and finally as
- anything in the world have advantages and disadvantages.

Reference :

Analytical Chemistry seventh edition by Gary D. Christian

Thank you