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.
High-performance liquid chromatography (HPLC), formerly referred to as 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
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

Factors

- Internal dimer of column
- Pump pressure
- Sample size
- Temperature
- Polarity of sample
Application of HPLC

- Pharmaceuticals industry.
- Analysis of natural contaminations.
- Forensic tests.
- Clinical tests.
- Food and essence manufactures.
Advantages and Disadvantages of (HPLC).

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<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tr>
<td>High separation capacity, enabling the batch analysis of multiple components.</td>
<td>Cost and Complexity.</td>
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<td>High sensitivity.</td>
<td>Sensitivity and Resolution.</td>
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<td>Low sample consumption.</td>
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<td>Easy preparative separation and purification of samples.</td>
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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