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Chromatography

Group of techniques used to separate complex mixtures on basis of different physical interactions between a stationary and mobile phase

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Chromatography (cont)

Basic components

- mobile phase (gas or liquid)

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- stationary phase (solid or liquid)

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- column holding stationary phase

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Chromatography (cont)

- separated components (eluate)

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- complex mixture (sample)

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Chromatography (cont)

Forms

- Planar

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- Paper

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Chromatography (cont)

Column

- Gas (GC)- can be mobile or stationary (polymer silica)

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Chromatography (cont)

- Liquid (LC) - mobile phase - high pressure and connected to mass spec

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Chromatography (cont)

Modes of Separation

- Adsorption - liquid-Solid (hydrophobic and Hydrophilic bonds)

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- Partition - Liquid-Liquid

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Chromatography (cont)

- Steric exclusion - Variation of liquid-Solid

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Chromatography (cont)

- Ion-exchange chromatography - Magnitude and charge (separation of amino acids)

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Chromatography (cont)

- Affinity

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CHROMATOGRAPHIC PROCEDURES

Thin-layer chromatography (TLC)

- A variant of column chromatography

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CHROMATOGRAPHIC PROCEDURES (cont)

- Thin layer of sorbent is uniformly coated on glass/plastic plate.

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CHROMATOGRAPHIC PROCEDURES (cont)

- Samples are applied as spots near edge of plate.

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CHROMATOGRAPHIC PROCEDURES (cont)

- One edge of plate is placed in solvent.

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CHROMATOGRAPHIC PROCEDURES (cont)

- Solvent migrates up thin layer by capillary action.

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CHROMATOGRAPHIC PROCEDURES (cont)

- After solvent reaches predetermined height, plate is removed and dried.

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HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

- Uses pressure for fast separations, controlled temperature, in-line detectors, and gradient elution techniques

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HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) (cont)

- Components: pumps, columns, sample injectors, detectors, recorders

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