General Principles of Liquid Chromatography

Size Exclusion Chromatography

- **TSK-GEL® Columns** for SEC
  - TSKgel 500 Series
  - TSKgel SHG Series
  - TSKgel Super-100 Series
  - TSKgel Prep Series
  - TSKgel Super-100 Series
  - TSKgel Super-RP Series
  - TSKgel R-5 Series

**Size Exclusion Chromatography (SEC)** is the method of choice for the separation of large molecules, such as proteins, polysaccharides, and nucleic acids. It is based on the size difference of the molecules that are being separated. The larger the molecular weight, the lower the elution volume. SEC columns are packed with spherical silica or polymer beads that have a high pore volume and high column efficiency. The mobile phase is typically a buffer solution or an organic solvent.

Ion Exchange Chromatography

- **TSK-GEL® Columns** for IEC
  - Amino Exchange Columns
  - TSKgel OA-STAT
  - TSKgel DNA-STAT
  - TSKgel DEAE-50W
  - TSKgel DEAE-25W
  - TSKgel CM-300W
  - TSKgel CM-150W
  - TSKgel CM-90W
  - TSKgel CM-50W
  - TSKgel SP-10W
  - TSKgel SP-5W
  - TSKgel SP-NP
  - TSKgel Phenyl-100
  - TSKgel Phenyl-50G
  - TSKgel SEC

Ion Exchange Chromatography (IEC) is one of the most versatile separation techniques in liquid chromatography. It is based on the exchange of charged ions between the stationary phase and the mobile phase. The key to the separation is the difference in the charge density of the molecules and the ligand on the chromatography media. The strength of the hydrophobic interaction of the salt components in the mobile phase is determined by the concentration of the salt in the buffer.

Affinity Chromatography

- **TSK-GEL® Columns** for Affinity
  - Group Specific Columns
  - TSKgel A6A-SPI
  - TSKgel R2A-50W
  - TSKgel Cl2H-75W
  - TSKgel Cl2H-40W
  - Activated Columns
  - TSKgel Tosyl-SPI

Affinity Chromatography (APC) is based on the specific interaction of the sample to be separated with the ligand present on the chromatography media. The ligand is selected so that it has a high affinity for the specific features of the target or sample, like size, charge, hydrophobicity, function or specific content of the molecule. The general principles of the most commonly used modes are outlined here.

Hydrophilic Interaction Chromatography

- **TSK-GEL® Columns** for HIC
  - TSKgel Aminic HP
  - TSKgel Amine HP
  - TSKgel Amine HP

Hydrophilic Interaction Chromatography (HIC) is a chromatographic technique that separates molecules according to their hydrophobicity and polarity. It is widely used for the purification of proteins and other macromolecules. HIC columns are packed with silica or polymer beads that have a high hydrophobic interaction capacity. The mobile phase is typically a buffer solution or an organic solvent.

Reversed Phase Chromatography

- **TSK-GEL® Columns** for RPC
  - Silica based Columns
  - TSKgel G3000SW TSKgel G1500SW TSKgel G5000SW
  - TSKgel ODZ-IH TSKgel ODZ-1000 TSKgel ODZ-1500
  - TSKgel ODZ-250 TSKgel ODZ-500 TSKgel ODZ-1000
  - TSKgel ODZ-2000 TSKgel ODZ-3000
  - TSKgel CN
  - TSKgel Oligo DNA
  - TSKgel TMO
  - Polymer based Columns
  - TSKgel Octyl Silica
  - TSKgel Phenyl-50W

Reversed Phase Chromatography (RPC) is a chromatographic technique that separates molecules according to their hydrophobicity and polarity. It is widely used for the purification of proteins and other macromolecules. RPC columns are packed with silica or polymer beads that have a high hydrophobic interaction capacity. The mobile phase is typically an organic solvent.

Hydrophobic Interaction Chromatography

- **TSK-GEL® Columns** for HIC
  - TSKgel Aminic HP
  - TSKgel Amine HP
  - TSKgel Amine HP

Hydrophobic Interaction Chromatography (HIC) is a chromatographic technique that separates molecules according to their hydrophobicity and polarity. It is widely used for the purification of proteins and other macromolecules. HIC columns are packed with silica or polymer beads that have a high hydrophobic interaction capacity. The mobile phase is typically an organic solvent.

TOSOH BIOSCIENCE offers a comprehensive line of media and pre-packed columns for all common modes of liquid chromatography including ion-exchange, hydrophobic- and hydrophilic-interaction, reversed-phase, size-exclusion and affinity. TSK-GEL® is available as both polymeric resin or in silica or polymeric-based pre-packed columns.