

High-performance liquid chromatography (HPLC) columns are used for the analysis or preparation of separated compounds from complex mixtures. The pressurized liquid solvent containing the sample mixture passes through a column filled with a solid adsorbent material. Since each component in the sample interacts with the adsorbent material slightly differently, the components with different flow rates are separated as they flow out of the column. According to separation mechanism, common HPLC column types are classified as normal/reversed phase, mixed-mode, ion exchange, ligand exchange, and affinity column formats.

The physical properties of the target component are the decisive factor in the selection of a column. The molecular characteristics that influence HPLC column selection include molecular size, hydrophobicity/hydrophilicity, intermolecular force, and intramolecular force. In addition, the inner diameter and volume of the column determine how much sample that can be loaded on the column and the sensitivity of the separation.