Chiral HPLC Column Selection and Method Development Guide

Choosing a Column Based on Application Area

Choosing a Column Based on CSP Type

The chiral selection of today’s successful CSPs is based on or mimic complex biomolecules, like proteins, peptides, and carbohydrates. The abundance of types of CSPs is necessary: each enantiomer separation is unique and requires specific differentiating interactions. Choosing a CSP is often based on the preferred mobile phase system, for optimal sample solubility, preparative considerations, and instrument compatibility.

Choice of Chiral HPLC and SFC Phases from Supelco

Chiral Column Screening Kits

Our chiral column screening kits provide the necessary columns to perform most chiral separations and run mechanistic studies, and are offered at very attractive prices.

HPLC Column Screening Kit*

GC Column Screening Kit*

These screening protocols should provide a rapid determination of the most suitable column and mobile phase combination for an enantiomer separation. The optimization guidelines should fine-tune the separation.

General Method Development Notes

- Do not operate outside the phase’s recommended range of solvents, temperatures, pressure, etc.
- Allow 10 column volumes for equilibration in new mobile phase. CHIRALBIC™ columns can take longer (1-2 hours) than the typical 10 column volumes to equilibrate. In addition, when changing the mobile phase ratio, equilibration time will need to be re-evaluated.
- Move to next mobile phase system or column if there is no resolution after 30 minutes, or if only a single sharp peak is observed.
- Temperature: Increased temperature generally increases efficiency and improves peak shape. Decreased temperature generally increases chiral selectivity (enhances the weaker bonding force). If operating from 50 °C to 70 °C, depending on how harsh the mobile phase, increase the temperature at 1 °C/min maximum. Higher temperatures can reduce column lifetime, especially at pH extremes. Maintain temperature within ±1 °C to minimize reproducibility.
- Flow rates: Chiral separations usually benefit from lower flow rates. Optimum flow rates are dependent and could be as low as 0.2 mL/min for a 4.6 mm ID Column. Test optimum for your separation.