

CURRENT PROBLEM/CONCERN	COLUMN	SUGGESTED CONDITIONS
Improve Selectivity		
Need improved selectivity for nonelectrolytes, isomers, diastereomers. Currently using carbon, cyano, phenyl or fluoro phases	DiamondBond® C18, ZirChrom®-CARB	Use an acetonitrile and/or THF eluent. Set column temperature ≥ 50 °C. Add octylamine to improve peak shape.
Need improved selectivity for bases.	ZirChrom®-MS, ZirChrom®-PBD	Use buffer of your choice in a pH range of 1-10. If required, 5 - 25 mM phosphate may improve peak shape. If using ZirChrom®-PBD, increase pH above pKa (stable to pH 14).
Need improved selectivity for acids.	ZirChrom®-EZ, ZirChrom®-MS	Use buffer of your choice in a pH range of 1-10. Try low pH first. 5 - 25 mM phosphate may improve peak shape.
Change Retention		
Need more retention for very polar (hydrophilic) nonelectrolytes. Currently using nearly 100% water eluent or polar embedded phase	DiamondBond® C18, ZirChrom®-CARB	Can use in high water mobile phase.
Need more retention for very polar bases. Currently using nearly 100% water eluent or polar embedded phase or <i>sulfonic acid paired ion reagent</i>	ZirChrom®-MS	Use buffer of your choice in a pH range of 1-10. If required, 5 - 25 mM phosphate may improve peak shape. High water mobile phases are no problem.
Need more retention for very polar acids. Currently using nearly 100% water eluent or polar embedded phase or <i>quaternary amine paired ion reagent</i>	ZirChrom®-EZ, ZirChrom®-MS	Use buffer of your choice in a pH range of 1-10. Try low pH first. 5 - 25 mM phosphate may improve peak shape.
Need less retention with any solute type.	ZirChrom®-PS	Least hydrophobic ZirChrom phase. Can be used with 100% water eluent.
Improve Efficiency / Productivity		
Inadequate stability and selectivity. Having trouble with silica-based phases, changed to alumina or polymer column and problems were <i>still not</i> sufficiently resolved.	All ZirChrom® Reversed-Phase (RP) Columns	Zirconia phases exhibit excellent pH and temperature stability. ZirChrom® RP columns give higher efficiency and better peak shape than alumina or polymer columns.
Poor column reproducibility. Experiencing retention changes at extreme pH, at elevated temperature or when using phosphate or carbonate buffer.	All ZirChrom® RP Columns	Zirconia phases are very reproducible from batch-to-batch, column-to-column and run-to-run. Every column is QCed.
Separations taking too long.	All ZirChrom® RP Columns	Increase temperature up to max. operating range for LC &/or analyte. Increase flow rate. Easily improves speed 2-3 fold.
Column overloaded too easily with basic solutes.	ZirChrom®-MS, ZirChrom®-PBD	The mixed-mode (reversed-phase / cation exchange) retention mechanism enables enhanced column loadability.
Improve Detection Sensitivity		
Need to go to shorter wavelength to enhance sensitivity in UV. Solute does not have long wavelength absorption or is very dilute	ZirChrom®-PS	Use a high water or pure water eluent and go deep into UV.
Need LC/MS detection of Lewis base analytes at low pH.	ZirChrom®-EZ, ZirChrom®-MS	Use buffer of your choice (in pH range 1-10) with these Lewis acid site deactivated phases.
Need to decrease bleed in LC/MS.	All ZirChrom® RP Columns	All ZirChrom® columns are extremely low bleed. The ZirChrom®-MS column was designed especially for LC/MS.