

CURRENT PROBLEM/CONCERN	COLUMN	SUGGESTED CONDITIONS
<b>Improve Selectivity</b>		
<b>Need improved selectivity for nonelectrolytes, isomers, diastereomers.</b> Currently using carbon, cyano, phenyl or fluoro phases	DiamondBond® C18, ZirChrom®-CARB	Use an acetonitrile and/or THF eluent. Set column temperature $\geq 50$ °C. Add octylamine to improve peak shape.
<b>Need improved selectivity for bases.</b>	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).
<b>Need improved selectivity for acids.</b>	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.
<b>Change Retention</b>		
<b>Need more retention for very polar (hydrophilic) nonelectrolytes.</b> Currently using nearly 100% water eluent or polar embedded phase	DiamondBond® C18, ZirChrom®-CARB	Can use in high water mobile phase.
<b>Need more retention for very polar bases.</b> 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.
<b>Need more retention for very polar acids.</b> 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.
<b>Need less retention with any solute type.</b>	ZirChrom®-PS	Least hydrophobic ZirChrom phase. Can be used with 100% water eluent.
<b>Improve Efficiency / Productivity</b>		
<b>Inadequate stability and selectivity.</b> 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.
<b>Poor column reproducibility.</b> 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.
<b>Separations taking too long.</b>	All ZirChrom® RP Columns	Increase temperature up to max. operating range for LC &/or analyte. Increase flow rate. Easily improves speed 2-3 fold.
<b>Column overloaded too easily with basic solutes.</b>	ZirChrom®-MS, ZirChrom®-PBD	The mixed-mode (reversed-phase / cation exchange) retention mechanism enables enhanced column loadability.
<b>Improve Detection Sensitivity</b>		
<b>Need to go to shorter wavelength to enhance sensitivity in UV.</b> 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.
<b>Need LC/MS detection of Lewis base analytes at low pH.</b>	ZirChrom®-EZ, ZirChrom®-MS	Use buffer of your choice (in pH range 1-10) with these Lewis acid site deactivated phases.
<b>Need to decrease bleed in LC/MS.</b>	All ZirChrom® RP Columns	All ZirChrom® columns are extremely low bleed. The ZirChrom®-MS column was designed especially for LC/MS.