HILIC columns vs. Cogent TYPE-C silica based columns

The Cogent TYPE-C columns all perform similarly to HILIC as far as polar compound elution order is concerned when using higher than 70% organic composition of the mobile phase. Both columns perform separations that are based on variations of normal phase called Aqueous Normal Phase (ANP). The **HILIC stationary phase is typically more polar than the TYPE-C** bonded phase which is relatively non polar. HILIC columns will retain polar compounds that cannot be retained by other columns and so will the TYPE-C columns. The HILIC columns will not retain non-polar compounds. This is **one of the big advantages for the TYPE-C columns, where polar and non-polar compounds can be separated in the same isocratic run**. On HILIC columns, polar compounds partition into and out of the hydration shell created by adsorbed water on the silica surface. As the acetonitrile concentration increases the water layer decreases and the charged polar analytes are retained by the combination of cation exchange with the silanols under the water layer and the partitioning effect. The combination of these two mechanisms retains polar compounds in HILIC mode. On Cogent TYPE-C Columns, the charged polar compounds elute in a similar order as on HILIC columns as stated above. However, non-polar compounds will be retained at the same time by the non polar ligand of the Cogent TYPE-C columns which is the bonded phase. Since there are virtually no silanols to speak of on these columns, the polar compounds are retained more by the adsorptive character of the silica-hydride and silica backbone which are now more available to the analytes due to a very shallow solvent layer which is the organic component such as acetonitrile, methanol etc. when at higher concentrations of the organic component. **Because of the lack of a hydration shell at high organic content due to the weak association with water of the TYPE-C silica, the shell will equilibrate and change more rapidly with TYPE-C columns then with HILIC columns.** This is an advantage for rapid gradients. HILIC columns can only perform HILIC which is Aqueous Normal Phase while TYPE-C Silica based columns can perform Aqueous Normal Phase, Reverse Phase and traditional Normal Phase using completely non-polar solvents such as hexane. There is no hysteresis when changing between these modes making this column extremely efficient.

IN SUMMARY

Cogent TYPE-C columns for ANP chromatography outperform HILIC columns in the following areas:

* retain nonpolar compounds by reversed phase mechanism

* retain polar compounds by normal phase mechanism

* both reversed phase and normal phase mechanisms can operate simultaneously

* can separate samples with both polar and nonpolar compounds

* equilibration time for gradient elution is 5 minutes between runs

* repeatability for biological samples is around 0.5% RSD

Bidentate C18 phase