

Selectivity Differences in Cogent TYPE-C Stationary Phases - Tech Information

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Using Different Cogent TYPE-C™ HPLC Stationary Phases for Selectivity Control – Tech Information

Selecting the right stationary phase is one of the most powerful tools in chromatographic method development. Cogent™ TYPE-C™ HPLC columns provide several unique bonded-phase chemistries, each engineered to offer distinct selectivity profiles that help analysts optimize resolution, retention, and peak shape across a broad spectrum of analytes.

1. Why Selectivity Matters in Method Development

Different analytes interact with stationary phases through hydrophobic, polar, steric, and secondary interactions. Even subtle changes in stationary-phase chemistry can dramatically alter resolution. Cogent TYPE-C™ columns use silica-hydride particles, enabling consistent surface chemistry and highly predictable selectivity across RP, ANP, and NP modes.

2. Selectivity Differences Between TYPE-C™ Ligands

Each Cogent bonded ligand provides its own retention profile, allowing users to tune chromatographic behavior without altering mobile-phase components. For example:

- Cogent Bidentate C18™: A more hydrophobic phase with stronger overall retention.
- Cogent UDC-Cholesterol™: Exhibits sharper selectivity differences for challenging separations, especially aromatic compounds.

Under identical chromatographic conditions, these two phases can resolve analytes very differently. In a demonstrated comparison, UDC-Cholesterol™ produced a separation factor (α) of 2.30 between anthracene and tert-butylbenzene, versus 1.58 on the Bidentate C18™ — a significant gain in selectivity that directly improves resolution.

3. Advantages Across Multiple Retention Modes

These selectivity patterns are not limited to reversed-phase. Because TYPE-C™ columns can operate in Aqueous Normal Phase (ANP), standard Normal Phase (NP), and RP, method developers can exploit ligand-specific selectivity across multiple modes using a single family of stationary phases.

4. Practical Benefits in Real-World Method Development

- Faster optimization: Swap ligand chemistry instead of rebuilding gradient systems.
- Better resolution of structurally similar analytes: Especially aromatics, isomers, and partially hydrophobic species.

- Predictable behavior: Silica-hydride surfaces minimize silanol interference, promoting consistent peak shapes and retention.
- Versatility: One phase family supports three chromatographic modes using the same column type.

Whether you're troubleshooting a difficult method or developing a new separation from scratch, leveraging TYPE-C™ selectivity differences can dramatically shorten development time and improve analytical outcomes.

Summary

Cogent TYPE-C™ stationary phases provide unique selectivity profiles determined by their bonded ligands. Phases such as Bidentate C18™ and UDC-Cholesterol™ can exhibit dramatically different retention behaviors under the same conditions, enabling analysts to fine-tune separation selectivity without changing mobile phases.

For example, UDC-Cholesterol™ has shown superior selectivity between certain aromatic analytes, yielding higher separation factors and better resolution. Because TYPE-C™ columns also support RP, ANP, and NP modes, selectivity advantages extend across multiple separation strategies, making these columns powerful tools for advanced method development .



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