

## Avoid Ion Suppression Issues in LCMS if You Need to Use an Ion-Pair Agent - HPLC Primer

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### How to Avoid Ion Suppression in LC-MS When You Need to Use an Ion-Pair Agent

Ion-pair reagents are frequently used in traditional reversed-phase (RP) HPLC to increase the retention of poorly retained analytes or to improve peak shape caused by silanolic tailing.

However, in LC-MS these additives often introduce serious ion suppression, reduced sensitivity, increased contamination, and difficult system cleanup.

Fortunately, when using Cogent TYPE-C™ silica hydride columns, ion-pair agents are typically unnecessary because the columns themselves provide the required retention and selectivity without compromising MS performance.

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### Why TYPE-C™ Columns Reduce or Eliminate the Need for Ion-Pair Agents

The surface of a TYPE-C silica hydride column contains very few silanol groups, dramatically reducing the traditional causes of peak tailing. Reduced silanol activity eliminates the need for ion-pair agents that are typically used to mask these interactions in RP mode.

Furthermore, TYPE-C columns uniquely support Aqueous Normal Phase (ANP), a mechanism that naturally provides strong retention for polar and charged compounds—including both small molecules (<100 Da) and larger analytes such as peptides—without the need for ion-pairing chemistry.

### How ANP Avoids Ion Suppression in LC-MS

Because ANP functions effectively with low-concentration volatile additives, it is inherently more compatible with LC-MS. Typical ANP mobile phases use:

- Formic acid
- Acetic acid
- Ammonium acetate
- Ammonium formate

All are recommended at  $\leq 10$  mM, ensuring they remain MS-friendly and do not cause ion suppression problems. This allows the analyst to retain and separate charged or highly polar compounds without introducing the high-concentration non-volatile salts associated with traditional ion-pairing.

### Who Benefits Most from This Approach?

Scientists working with:

- Charged analytes (positive or negative) with molecular weights below 100 Da
- Peptides and small biomolecules
- Polar uncharged compounds

These analyte classes routinely exhibit strong, stable retention in ANP mode without ion-pair agents, allowing for clean MS detection and long-term instrument stability.

### **Summary of Advantages When Using TYPE-C Columns Instead of Ion-Pairing**

- Eliminates common LC-MS ion suppression pathways
- Avoids column fouling associated with ion-pair reagent adsorption
- Maintains excellent peak shape due to low silanol activity
- Provides strong ANP retention for polar compounds
- Uses only low-level volatile additives ( $\leq 10$  mM) suitable for MS detection

[Click HERE for Cogent Diamond Hydride HPLC Column Ordering Information.](#)



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