

Injecting Highly Acidic Samples on Cogent TYPE-C Silica HPLC Columns - Tech Information

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Introduction

Analysts sometimes need to inject samples that are highly acidic, raising concerns about whether such injections may damage Cogent TYPE-C™ silica hydride columns. The key consideration is the difference between sample pH and mobile-phase pH, as column longevity is governed by the mobile-phase conditions rather than the brief exposure to injected sample.

This article explains why **highly acidic samples can generally be injected** safely and what chromatographers should expect when the sample and mobile-phase pH differ significantly.

Column pH Specifications Apply to the Mobile Phase

Cogent TYPE-C™ silica columns must be operated within a specific pH range in order to maintain long-term stability. These pH limits refer specifically to the mobile phase, not the injected sample. Because injection volumes are very small relative to the continuous mobile-phase flow, the overall pH environment inside the column remains effectively controlled by the mobile phase. As a result, injecting a highly acidic sample does not normally reduce column lifetime, provided that the mobile phase itself stays within the specified pH operating window.

Possible Impact on Peak Shape

Even though acidic sample injections will not typically damage the column, analysts may observe peak distortions when there is a large pH mismatch between the sample diluent and the mobile phase. This effect is not harmful and does not indicate deterioration of the stationary phase. Rather, it is a predictable chromatographic phenomenon arising from transient pH differences at the column head. Such distortions usually resolve when either (1) the sample diluent is adjusted closer to the mobile-phase pH or (2) a small pre-column mixing zone in the system helps minimize pH shock.

Practical Recommendations

- Maintain mobile-phase pH within the column's specifications at all times.
 - If peak distortion occurs, adjust the sample diluent pH to be more similar to the mobile phase.
 - Avoid unnecessarily large injection volumes, as these may amplify pH mismatch effects.
 - Remember that transient peak-shape changes do not imply damage to TYPE-C™ silica surfaces.
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Conclusion

Highly acidic samples can be injected onto Cogent TYPE-C™ silica columns without shortening column lifetime, as long as the mobile-phase pH remains within the recommended operating limits.

While mismatched sample and mobile-phase pH may cause temporary peak-shape artifacts, these effects are benign and easily corrected by adjusting sample preparation conditions.

[sample diluent and mobile phase pH differ](#).



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