

Metal Contents of the Silica Used in TYPE-C HPLC Columns - HPLC Primer

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What Are the Metal Contents of the Silica Used in Cogent TYPE-C™ HPLC Columns?

Short answer: The base silica for Cogent TYPE-C™ columns is qualified by ICP (Inductively Coupled Plasma) analysis against strict acceptance specs for common trace metals.

The specification limits are: Al ≤ 5.0 ppm, Fe ≤ 20.0 ppm, Ti ≤ 0.5 ppm, Mg ≤ 5.0 ppm, Ca ≤ 15.0 ppm, Na ≤ 20.0 ppm. *Actual measured levels are often significantly lower than these limits.*

Why do trace metals matter in HPLC silica?

Even at the parts-per-million level, residual metals in silica can influence surface chemistry, potentially affecting:

- Secondary interactions with acidic, basic, or chelating analytes (e.g., tailing or shifting retention).
- Baseline stability or adsorptive artifacts in LC/MS workflows, especially for low-abundance polar species.

By setting low acceptance thresholds and verifying by ICP, Cogent TYPE-C™ aims to minimize these effects while preserving the unique silicon-hydride (Si-H) surface properties that differentiate the platform from ordinary silica.

The specification limits (verified by ICP)

- **Aluminum (Al):** not more than **5.0 ppm**
- **Iron (Fe):** not more than **20.0 ppm**
- **Titanium (Ti):** not more than **0.5 ppm**
- **Magnesium (Mg):** not more than **5.0 ppm**
- **Calcium (Ca):** not more than **15.0 ppm**
- **Sodium (Na):** not more than **20.0 ppm**

Note: The actual levels measured are often well below these maxima.

Context: TYPE-C™ silica vs. ordinary silica

Cogent TYPE-C™ employs a silica-hydride surface with minimal silanol activity, supporting fast equilibration, mixed-mode (ANP / RP / NP) selectivity, and reduced water sorption compared with conventional silica. Maintaining tight control of trace metals supports this behavior and the column's consistency across lots.

Summary

Cogent TYPE-C™ silica is controlled for trace metals by ICP, with tight ppm-level limits on Al, Fe, Ti, Mg, Ca, Na, and typical results below those limits. This quality control helps preserve the distinctive Si-H surface performance and minimizes unwanted secondary interactions during analysis.



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