RSA-Pro X Surface Treatment Process Does Not Add Chlorides to the Glass Surface - Tech Information

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Does the RSA-Pro X™ Surface Treatment Add Chlorides to Autosampler Vials?

Short Answer

No. The RSA-Pro X™ deactivation process does not introduce chlorides or chloride-containing species to the glass surface.

Detailed Technical Explanation

1. Background: Why Users Ask About Chlorides

Analytical chemists—particularly those operating in LC-MS, IC, or trace-level impurity workflows—are understandably cautious about potential contaminants introduced by vial surface treatments. Chlorides, if present, can:

- Participate in ion suppression / ion enhancement effects in electrospray sources
- Produce analytically visible adducts (e.g., [M + Cl]–)
- Contribute to corrosive interactions, especially in high-temperature GC systems
- Compromise ultra-low–level quantitation, especially for halogenated species or ion chromatography workflows

Because many vial-deactivation processes depend on halogenated silanes or other reactive precursors, concern about chloride incorporation is reasonable.

2. RSA-Pro X™ Surface Engineering Overview

RSA-Pro X™ is a specialized hydrophobic surface modification applied to RSA™ (Reduced Surface Activity) borosilicate glass. While the precise chemistry is proprietary, the process is engineered to:

- Produce a hydrophobic, non-adsorptive surface
- Resist hydrolytic degradation
- Maintain inertness even under high-moisture, high-water, or aqueous biological conditions
- Support extended autosampler residence times, sample storage, and exposure to –80 °C or autoclaving

The key point is that this process creates an inert, stable surface without introducing ionic chlorides or chloride-based reagents. According to the official documentation, no chlorides are added at any point during the deactivation treatment.

3. Why the RSA-Pro X™ Process Does Not Introduce Chlorides

The treatment chemistry used in RSA-Pro X™ does not involve chloride-bearing precursors, reagents, or post-treatment steps.

This is explicitly stated in the official FAQ: “No, the RSA-Pro X™ surface treatments used do not add chlorides.”

In contrast to certain silanization techniques that utilize chlorosilanes (which release HCl during hydrolysis), the RSA-Pro X™ modification uses non-chlorinated, non-halogenating chemistries. As a result:

- No residual chloride ions are present on or near the glass surface.
- No chloride-related byproducts remain because none are generated.
- No risk of chloride-derived adducts exists for LC-MS workflows.

This design is particularly beneficial in situations where even trace halogens could compromise analytical specificity.

4. Analytical Implications for LC, LC-MS, GC, and IC Users

4.1 LC-MS

- No chloride-related adduct formation
- No ion suppression from ionic halides
- Cleaner mass spectra and improved detection limits

4.2 Ion Chromatography (particularly anion-IC)

- No exogenous chloride peaks
- Avoids baseline contamination
- Supports ultra-trace halogen analysis

4.3 GC / GC-MS

- No chloride-driven glass corrosion under high temperatures
- No potential breakdown products from halogenated surface chemistry

5. When to Choose RSA-Pro X™

RSA-Pro X™ is recommended when your workflow demands:

- Minimal adsorption of proteins, peptides, hydrophilic species, or charged biomolecules
- Long-term stability in aqueous media
- Hydrolytically stable, non-leaching surfaces
- Assurance that no halogen-based surface residues can interfere with detection

For users who must avoid any halogen artifacts—such as those in environmental analysis, PFAS studies, or trace ionic species quantitation—the confirmation that RSA-Pro X™ introduces zero chloride contamination makes it a highly reliable choice.

Click HERE for the RSA-Pro X technical information page with a demonstration video.

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