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Adsorption can happen quickly in an autosampler vial - Tips & Suggestions

Tips & Suggestions

Rapid Adsorption in Autosampler Vials: A Hidden Variable in Sample Integrity

Adsorption to borosilicate glass surfaces is time-dependent—but can occur rapidly.
Our previous studies have demonstrated that certain analytes can experience significant concentration loss due to surface adsorption in autosampler vials, even within minutes of sample preparation. This phenomenon poses a risk to data integrity, particularly in trace-level quantification.

Experimental Insight

In a controlled experiment, we monitored **5 ppm cetylpyridinium chloride** over short time intervals to assess adsorption behavior. Two vial types were compared:

- A market-leading "Certified" Type-33 borosilicate glass vial
- An **RSA™ (Reduced Surface Activity)** vial designed to minimize surface interactions

Key Findings

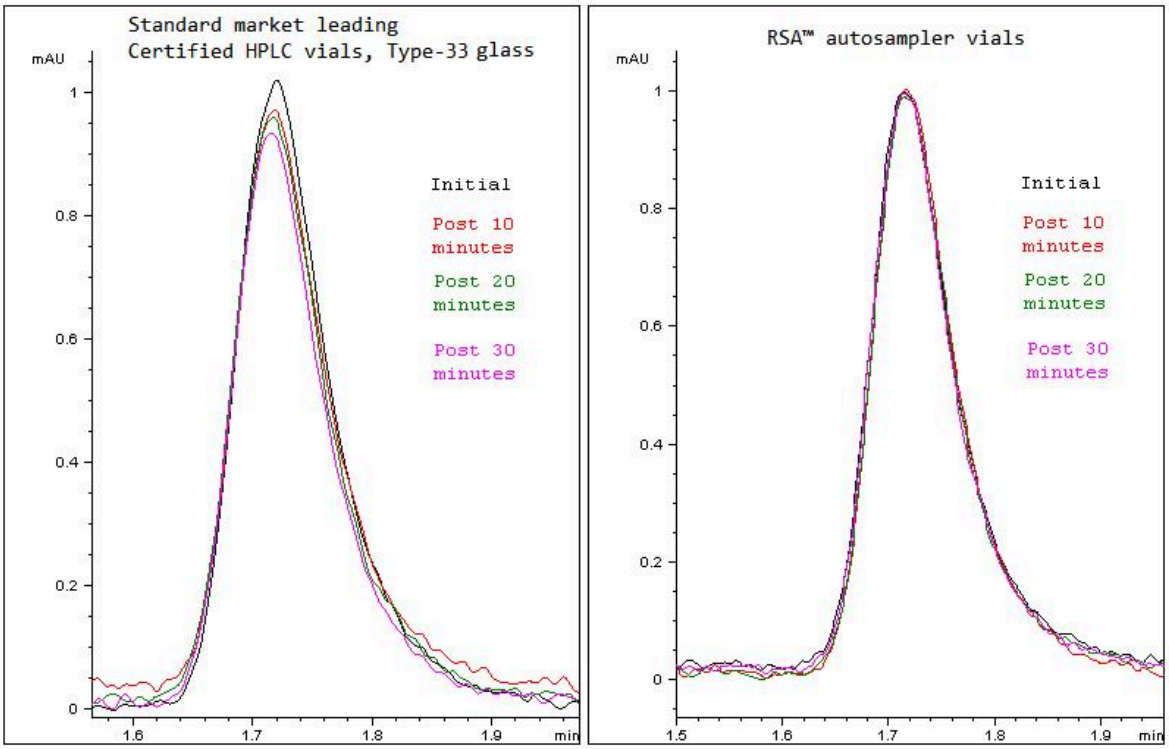
- In the **standard Type-33 glass vial**, a **notable decrease in peak area** was observed within just **15 minutes** post-preparation, indicating rapid analyte loss due to adsorption.
- In contrast, the **RSA™ vial** maintained consistent peak area, demonstrating superior surface inertness and analyte recovery.

Implications for the Lab

- Even short autosampler queue times can introduce variability in quantitation.
- Surface activity of vial materials should be considered a **critical parameter** in method development and validation—especially for analytes prone to adsorption.

  Recommendation: For sensitive or adsorption-prone compounds, use RSA™ or similarly low-activity vials to preserve sample integrity and reproducibility.

In the chromatograms below, you can observe significant peak area diminishing in the standard HPLC vials *(left)*, in just a matter of fifteen minutes from the immediate prep and analysis, versus the peak area in RSA™ Vials *(Right)*.



RSA™
REDUCED SURFACE ACTIVITY GLASS

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