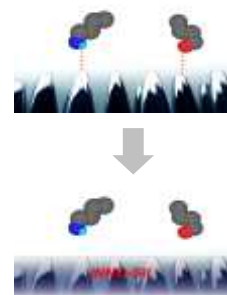


## Surface Treatment of Glass

### Adsorption

Liquids and gases tend to adsorb on solid surfaces. While these properties are used for separation in some chromatographic techniques, adsorption effects are often undesirable. Adsorption can negatively influence the quality of a chromatogram. Peak shape and peak width can be altered and the separation power of the chromatographic system can thus be reduced. Even more problematic is irreversible adhesion of parts of the sample on the surface. This leads to insufficient reproducibility, severe quantification errors and, in the worst case, analytes are completely swallowed and disappear from the chromatogram.

**Adsorption can occur anywhere where the sample comes in contact with a solid surface.** This is especially true for **glass surfaces**. Polar groups of the analyte can interact with free OH groups on the glass surface, if it is not sufficiently **deactivated** by special procedures.



### The Solution...

To avoid adsorption effects, we offer various types of silanization and siliconization for various applications. Such surface treatment procedures are already commonplace in the injection system of gas chromatographs (silanized liners!) and now reach the areas of sample preparation and storage. By the "sealing" of the glass surface achieved by these methods, the adsorption even of very sensitive compound classes such as pesticides, amines, phenols, steroids, proteins, and others, is significantly reduced or completely prevented. The denaturation of proteins on the glass surface can also effectively be avoided by these procedures. Finally, the wettability of the surface is reduced, so that more complete emptying of treated sample vials is possible. Accordingly, these methods provide an important contribution towards precise, reliable and reproducible analytical results.



### Silanization

Glass surfaces of new liners and glass wool for GC are always deactivated by a standard procedure. This deactivation is sufficient for most applications. However, in some cases, e.g. for pesticide analysis, higher demands must be met. Choose the perfect deactivation for your analytical needs;

#### Sil

##### Standard silanization, non-polar

This high temperature silanization process results in chemically and thermally stable, non-polar surfaces covering most free OH groups.

#### PM-Sil

##### Phenyl methyl silanization, medium polarity

Analogous to the Sil method, but with medium polarity.

#### INNO-Sil

##### High quality silanization for the highest demands on inertness

A new deactivation procedure developed by CS for **highest inertness of the glass surface**, prevents adsorption even for sensitive compounds such as **pesticides, amines, steroids, and phenols**.

### Siliconization

Siliconization creates a durable and inert silicone protective layer on a glass surface. This effectively protects the contents of a siliconized bottle from changes through adsorption on the one hand and leaching of glass components (metal ions, alkaline substances) on the other hand. Additionally, the silicone layer decreases wetting of the glass and so facilitates complete emptying of the bottle. Therefore, siliconized bottles have long been indispensable e.g. as packaging for liquid pharmaceutical formulations.

Procedure adapted from "Siliconization with Dow Corning Medical Materials", Dow Corning Corp., Midland, USA (1983)

### Acidic Surface Treatment – HCl Treatment

Glass surfaces are amphoteric; silanol groups at the surface can be either protonated or deprotonated, with the alkali content of the glass playing an important role. Depending on their  $pK_a$  values, different analytes can be adsorbed to such charged glass surfaces to varying degrees. Additionally, traces of basic compounds and metal ions can be released into the sample from the glass surface. Acid treatment of the glass reduces the number of basic groups on the surface, which is especially advantageous for the chromatographic trace analysis of acidic compounds.

## Surface Treatment of Glass – Sample Order Form 02/2020

Customer Address (Stamp):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Cust. No.:

\_\_\_\_\_

Contact:

\_\_\_\_\_

Order No.:

\_\_\_\_\_

### Pricing Silanized, Siliconized, and HCl Treated Vials

Complete price list refer to catalogue 2020-d, pages 6-7, prices valid from Jan 1<sup>st</sup>, 2020 to Mar 31<sup>st</sup>, 2022, plus VAT.

| Vial Size       | Volume       | Price Vial     | Fee -Sil -HCl | Fee -PM-Sil | Fee -INNO-Sil | Fee -Silikonisierung |
|-----------------|--------------|----------------|---------------|-------------|---------------|----------------------|
| Crimp Top 11 mm | up to 2 ml   | cf. price list | 12.50         | 13.50       | 14.50         | 50.00                |
| Crimp Top 13 mm | up to 2.5 ml | cf. price list | 16.00         | 17.00       | 18.00         | 50.00                |
| Crimp Top 20 mm | 5 ml         | cf. price list | 20.00         | 21.00       | 22.00         | 80.00                |
| Crimp Top 20 mm | 10 ml        | cf. price list | 24.00         | 25.00       | 26.00         | 90.00                |
| Crimp Top 20 mm | 20 ml        | cf. price list | 40.00         | 42.00       | 44.00         | 100.00               |
| Crimp Top 20 mm | 50 ml        | cf. price list | 100.00        | 105.00      | 110.00        | 120.00               |
| Screw Top 8 mm  | up to 2 ml   | cf. price list | 12.50         | 13.50       | 14.50         | 50.00                |
| Screw Top 9 mm  | up to 2 ml   | cf. price list | 12.50         | 13.50       | 14.50         | 50.00                |
| Screw Top 13 mm | up to 4 ml   | cf. price list | 18.00         | 19.00       | 20.00         | 70.00                |
| Screw Top 18 mm | 5 ml         | cf. price list | 20.00         | 21.00       | 22.00         | 80.00                |
| Screw Top 15 mm | 8 - 12 ml    | cf. price list | 24.00         | 25.00       | 26.00         | 90.00                |
| Screw Top 18 mm | 10 ml        | cf. price list | 24.00         | 25.00       | 26.00         | 90.00                |
| Screw Top 18 mm | 16 ml        | cf. price list | 36.00         | 38.00       | 40.00         | 95.00                |
| Screw Top 18 mm | 20 ml        | cf. price list | 40.00         | 42.00       | 44.00         | 100.00               |
| Screw Top 20 mm | 24 ml        | cf. price list | 48.00         | 50.00       | 52.00         | 110.00               |
| Screw Top 24 mm | 20 ml        | cf. price list | 40.00         | 42.00       | 44.00         | 100.00               |

### Sample Ordering for Surface Treated Glass Vials

| P/N | Description | Sil | PM-Sil | INNO-Sil | Siliconized | HCl Treated |
|-----|-------------|-----|--------|----------|-------------|-------------|
|     |             |     |        |          |             |             |
|     |             |     |        |          |             |             |
|     |             |     |        |          |             |             |
|     |             |     |        |          |             |             |



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