



CHROMATOGRAPHIC SPECIALTIES INC.

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Tech Note CS29

CLEANING AND SILYLATING GC INJECTOR LINERS

This technical note is intended to provide GC users with our recommended procedures for cleaning and deactivating injection port liners. For further information contact our Technical Department at 1-800-267-8103 or by email at tech@chromspec.com.

For liners that are merely dirty, with no permanent discoloration, and no scratches or cracks, cleaning often returns them to a usable condition. Over time, liners slowly lose their deactivation and eventually may not be suitable for use with active solutes. A simple cleaning will not restore these liners to their previous level of inertness, instead these liners must undergo a resilylation procedure.

Cleaning Procedure

Undamaged liners can be rinsed with solvents to remove solids and trapped materials. A small, nylon bristled brush can be used to dislodge the more stubborn residues. Care must be taken not to scratch the liner with the brush or the liner may be rendered active. A liner can also be ultrasonicated to remove stuck-on residues. Ultrasonication works well for liners with complex interiors that are difficult to clean with a small brush.

Deactivation Procedure

Active liners can be deactivated using the following resilylation procedure. Silylating reagents are very reactive, they are often flammable, corrosive and react violently on contact with large amounts of water or alcohol solvents (methanol, ethanol, isopropanol, etc). Care must be taken when working with these materials.

The following method should be used to silylate liners:

1. Place the liner in a screw cap test tube fitted with a Teflon-lined cap.
2. Soak the liner for between 8 and 24 hours in 1N hydrochloric acid (HCl). Do not soak for more than 24 hours.
If the solution is highly discoloured after soaking, replace it with a clean acid and repeat.
3. Remove the liner from the acid solution and thoroughly rinse with deionized water, followed by methanol.
4. Dry the liner at 100 - 150°C.
5. Place the clean and dry liner in a clean screw cap test tube fitted with a Teflon-lined cap.
6. Cover the liner with 10% trimethylchlorosilane or dimethyldichlorosilane in dry toluene or hexane.
7. Tightly cap the test tube.
8. Soak the liner for 8 more hours.
9. Remove the liner from the silane solution and thoroughly rinse with toluene (or hexane) then methanol.
10. Dry the liner at 75 - 100°C for 30 - 60 minutes.
11. The liner is now ready for use.