MICROSOLV

Silanizing glass autosampler vial or inserts for surface deactivation - Tech Information

Deactivate glass autosampler vials and inserts to minimize adsorption of proteins, peptides and other compounds for laboratory use, a "coating" process using a silicone oil dispersed in a solvent is commonly used.

This "mechanically" coated surface of the glass is commonly called "silanizing the glass". All of MicroSolv's deactivated glass is coated via an improved process called "Reactive Organosilane Bonding" which uses a reactive silane monomer or a multifunctional silane to "silanize". In this process, the reagents covalently bond with virtually all hydroxyl groups on the glass surface forming a semi-permanent hydrophobic surface layer that is less adsorptive and less reactive to many hydrophobic compounds or simply through "silanizing".

Reactive Organosilane Bonding Processes: Gas and Liquid.
Gas or liquid reagents form a semi-permanent covalent bond with most of the surface silanol (hydroxyl) groups This bonded "coating" is stable for several years even when exposed to these solvents and are not affected by water or organic chromatography solvents.

Advantages of Reactive Organosilane Bonding:

1. Application of reactive organosilane reagents can be implemented in either the gas or liquid phase.

2. Gas phase bonding and water based bonding systems will not yield residual solvents which may interfere with product stability or usage.

3. Reactive bonding coatings are stable on glass surfaces for many years prior to use. Long shelf life.

4. Reactive bonding coatings are stable for years during use (useful for long term storage of products) when used with water based, buffer and organic solvents

5. Reactive bonding coatings modify the wettability of the glass surfaces for polar compounds including proteins, peptides, phenols & amines thus reducing the adsorption.

6. Reactive bonding coatings can be tailored for the specific chemical class of material stored in glass vials or inserts upon request.

7. Reactive bonding coatings do not interfere with the sample and diluent used or stored in the vial or insert.

Disadvantages of Reactive Organosilane Bonding:

1. Reactive bonding coatings can be stripped off glass surfaces by strong basic solutions such as concentrated NaOH.

2. Reactive bonding coatings are more costly to apply to glass surfaces compared to silicone oil coatings.

3. These coatings are not very hydrolytically stable after 48 hours with water.

Liquid Reactive Organosilane Deactivation/Silanizing Process:
This process is a more costly process but leaves a very even coating. This process can be applied to vials and inserts on a special order basis.

Gas Reactive Organosilane Deactivation/Silanizing Process:

MicroSolv "Deactivated" vials and inserts are produced with gas phase Reactive Organosilane Deactivation process producing a uniform hydrophobic surface coating. Useful for storing pharmaceutical compounds, biopolymers, ago-chemicals, metabolites and natural products.

Advantages of Gas Phase Deactivation:

1. Gas phase deactivation process will produce the best coverage of silanol groups on the glass surface of all coating strategies.

2. Gas phase deactivated vials & inserts are stable for many years prior to use. Long Shelf life.

3. Gas phase deactivated vials & inserts are stable for long term storage when used with water or organic based chromatography solvents.

4. Gas phase deactivated vials & inserts have modified wettability of their surface thus minimizing the adsorption of polar compounds including proteins, peptides, phenols and amines.

Disadvantages of Gas Phase Deactivation:

1. Gas phase deactivation coatings can be stripped off glass surfaces by strong solutions of aqueous base such as concentrated NaOH.

2. Gas phase deactivation coatings can deposit a chloride residue on the vial surfaces that may interfere with ion chromatography or with LCMS.

3. These coatings are very hydrolytically stable after 48 hours with water.

MicroSolv Technology Corporation
9158 Industrial Blvd. NE, Leland, NC 28451
Tel: (732) 380-8900
Fax: (910) 769-9435
Email: customers@mtc-usa.com
Website: www.mtc-usa.com