

INSTRUCTIONS



AquaSil™ and SurfaSil™ Siliconizing Fluids

TS-42799 TS-42800 TS-42801 TS-42855

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Number	Description
TS-42799	AquaSil Siliconizing Fluid, 120 ml Flash Point: 10°C Specific Gravity: 0.88 Solidification Point: -30°C Note: AquaSil Siliconizing Fluid is an amber-colored monomeric octadecylsilane derivative supplied as a 20% solution by mass in t-butanol (CAS # 75-65-0) and diacetone alcohol (4-hydroxy-4-methyl-2-pentanone, CAS # 123-42-2). All three materials are flammable.
TS-42800	SurfaSil Siliconizing Fluid, 120 ml
TS-42801	SurfaSil Siliconizing Fluid, 480 ml
TS-42855	SurfaSil Siliconizing Fluid, 5 · 10 ml ampules CAS # 2474-02-4 Specific Gravity: 1.00-1.03 Flash Point: 87°C Note: SurfaSil Siliconizing Fluid is a polymeric silicone fluid consisting primarily of dichlorooctamethyltetrasiloxane. SurfaSil Fluid is flammable, corrosive and moisture-sensitive.

Storage: Upon receipt store siliconizing fluids at room temperature.

Introduction

Surface treatment with SurfaSil or AquaSil Siliconizing Fluids can reduce sample losses caused by nonspecific interactions with reaction vessels and containers, which can be significant when working with small amounts of protein. AquaSil Fluid forms silanol polymers in solution that react with the silanols (Si-OH) on the glass surface. Covalent bonds are formed among the hydroxyls on the glass and the silicon from the siliconizing agent. SurfaSil Fluid directly reacts with polar groups on the object's surface and results in a hydrophobic surface that resists nonspecific binding. The silanol bonds formed by these two reagents are able to withstand autoclaving conditions. Materials that can be siliconized include glass, plastics, and many metal surfaces, which is useful for preventing protein loss on glass columns, containers and other equipment. SurfaSil and AquaSil Siliconizing Fluids are applied by wipe-on or immersion methods. AquaSil Siliconizing Fluid is especially useful for protein chemistry applications because its working solution is prepared in water and does not require dilution in hazardous non-polar organic solvents.

Note: Some proteins bind to hydrophobic surfaces more readily than on hydrophilic surfaces.

Important Product Information

- AquaSil Siliconizing Fluid will slowly react with glass containers, and other primary and secondary alcohols and water to form silanols. The silanols gradually form polymers in the bottle even if unopened. If the solution becomes cloudy, it can be filtered, but with some loss of potency.
- A small amount of HCl is released when SurfaSil Siliconizing Fluid is coated onto glass or other surfaces.
- Wear gloves and any other pertinent safety equipment during the entire procedure. Perform procedure in a fume hood to protect against acid fumes.

Glassware Preparation

Thorough cleaning of glassware ensures maximum coating. The following procedures or similar variations can be used to clean glassware before siliconizing. Use of acid or base to prepare glassware etches glass and exposes more sites with which the siliconizing agent can react.

1. Clean glassware with RBS-35[®] Cleaning Solution (Product No. 27952) or other laboratory cleaner.
2. Thoroughly rinse glassware with distilled water to remove residue. Dry surface in an oven at 200°C for at least 15 minutes.

Note: Multiple layers of silane can form on the glass surface if water is not completely removed.

Procedure for Siliconizing Surfaces by the Immersion Method

When a siliconizing agent is applied to a surface, the surface becomes hydrophobic and is able to repel or bead water. Inability of the glass surface to repel water is an indication that a surface needs recoating.

AquaSil Siliconizing Fluid: Immersion Technique

1. Dilute AquaSil Siliconizing fluid with water to give a 0.1 to 1.0% solution. AquaSil Fluid contains 20% active ingredient; therefore, a 1:100 dilution gives a 0.2% solution. The solution will be clear to slightly hazy. Prepare this solution on the same day as use because the diluted preparation is not indefinitely stable. Stability can be enhanced by adjusting the aqueous solution to pH 4.5-5.0 using HCl.

Note: If the concentrate is hazy, filter to remove polymers. It may be necessary to make a more concentrated working solution if the concentrate becomes too polymerized.

2. Completely immerse the object to be coated in the diluted solution for at least 5-10 seconds. Agitate the solution to ensure a uniform coat. A thin film will immediately coat the object's surface.
3. Rinse the object with methanol to remove excess siliconizing fluid.
4. Air-dry the object for 24 hours or heat at 100°C for 20-60 minutes to cure the silicone coating.

Caution: Use only vented explosion-proof ovens.

SurfaSil Siliconizing Fluid: Immersion Technique

Caution: SurfaSil Siliconizing Fluid evolves HCl as a by-product during coating.

1. Dilute SurfaSil Siliconizing fluid in a nonpolar organic solvent such as acetone, toluene, carbon tetrachloride, methylene chloride, chloroform, xylene or hexane. Typical working concentrations are 1-10% mass to volume.
2. Completely immerse or flood the dry object to be coated in the diluted SurfaSil Solution for at least 5-10 seconds. Agitate the solution to ensure a uniform coat. A thin film will immediately coat the object's surface.
3. Rinse the object with the same solvent in which the reagent was diluted.
4. Rinse the object with methanol. This rinse is required to prevent interaction of the SurfaSil Coating with water and thus, reversing siliconization.
5. Air-dry the object for 24 hours or heat at 100°C for 20-60 minutes.

Caution: Use only vented explosion-proof ovens.

Procedure for Siliconizing Surfaces by the Wipe-On Method

Caution: Wear gloves and perform procedure in a well-vented fume hood.

1. Wet a cloth with undiluted siliconizing agent and rub onto a clean surface until an oily film forms on the entire surface.
 2. Rub the surface with a dry cloth until the surface is dry. Cloudiness on the glass surface indicates excess material is on the object's surface. Continued rubbing with a dry cloth or a wash with a nonpolar organic solvent such as hexane can be used to remove the excess siliconizing agent.
 3. Rinse the object with methanol.
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Preparation for Disposal

AquaSil Siliconizing Fluid is flammable but not corrosive and can be reacted with a primary or secondary alcohol or water and then disposed with normal flammable waste.

SurfaSil Siliconizing Fluid is flammable, corrosive and water reactive. Before disposal, slowly drip this compound onto ice in a fume hood. After the ice has melted and all the siliconizing fluid is added, neutralize the solution with stirring using dilute sodium carbonate or bicarbonate. The reacted siliconizing agent is now no longer water reactive or corrosive but still may be flammable. If the siliconizing agent has been diluted with any of several hazardous solvents, then the same procedure may be used for disposal; however, two layers may result upon reaction with water or ice. Be sure that both layers are neutralized before disposal.

Please dispose of all reagents according to local regulations.

Reference

Knapp, D.R. (1979). Handbook of analytical derivatization reactions. John Wiley & Sons, Inc.

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