



UNITED CHEMICAL TECHNOLOGIES, INC.

SELECTRA-SIL[®] Derivatizing Reagents

**Take a look at all of the advantages of using
UCT's high quality derivatizing reagents...**



Saving:

Compare our prices! Since we are a chemical manufacturer, all reagents go directly from our laboratories to yours.

Understanding:

A staff of skilled UCT chemists who have the hands-on experience using derivatizing reagents back our products.

Quality:

We sell only the highest quality derivatizing reagents and provide a 100% guarantee of satisfaction.

UCT Staff:

Friendly and knowledgeable; our technical support, sales and customer service teams are available to address any question or need.

SILYLATION REAGENTS

BSTFA*
MTBSTFA**
MSTFA*
TMCS

ACYLATION REAGENTS

MBTFA
HFAA
PFAA
PIA
TFAA
TFAI

ALKYLATION REAGENTS

4CB
TMPAH

SPECIALIZED REAGENTS

HFIP
PFPOH

*1% or 10% of TMCS can be added

**1% or 10% of t-BDMCS can be added

All of UCT's quality reagents are available in premixed solutions for enhanced reactivity and ease of handling. UCT offers convenient sizes ranging from one gram vials packaged in units of ten or 10, 25 and 100 gram vials.

Silylation Reagents

Silyl derivatives are the most widely used chemical derivatization reagents, especially for gas chromatography. Silyl derivatization requires an “Active” hydrogen as seen in acids, alcohols, thiols, amines, amides, enolizable ketones and aldehydes to be replaced by a trimethylsilyl group or tertiary butyl dimethylsilyl.

These reagents must be protected from moisture.

BSTFA and BSTFA with TMCS (1 or 10%)

(N, O-Bis(trimethylsilyl)trifluoroacetamide with/without Trimethylchlorosilane)

- Trimethylsilyl donor strength equal to BSA
- Reacts with the same classes of compounds as BSA producing the same derivatives.
- TMCS (Trimethylchlorosilane) added to derivatize amides, many secondary amines and hindered hydroxyls that are not reactive to BSTFA alone.
- Increased volatility of the reaction by-products over the non-fluorinated derivatives of BSA

MSTFA and MSTFA with 1% TMCS

(N-Methyl-N-Trimethylsilyltrifluoroacetamide with/without Trimethylchlorosilane)

- A trimethylsilyl adduct with donor strength equal to BSA and BSTFA
- Most volatile of the TMS derivatives often elutes at the solvent front of the GC.
- Addition of TMCS aids in the derivatization of amides, secondary amines and hindered Hydroxy groups.

MTBSTFA and MTBSTFA with 1% TBDMCS

(N-Methyl-N-[tertiary butyl dimethylsilyl] trifluoroacetamide with/without Tertiary-butyl dimethylchlorosilane)

- Derivatizes hydroxyl, carboxyl, thiol and primary and secondary amines
- Addition of TBDMCS (tertiary butyl-dimethylchlorosilane) increases the silylation ability of this reagent to derivatize hindered alcohols and amines
- MTBSTFA derivatives are more stable than TMS derivatives to hydrolysis
- Reaction by-products are neutral and volatile

TMCS

(Trimethylchlorosilane)

- Catalysts used to increase the reactivity of other silylation reagents
- Used to form trimethylsilyl esters of organic acids.

Silylation Reagents

BSTFA Bis(trimethylsilyl)trifluoroacetamide

Part #	Size	Units per pack
SBSTFA-0-1	1 gm vial	10
SBSTFA-0-10	10 gm vial	1
SBSTFA-0-25	25 gm vial	1
SBSTFA-0-100	100 gm vial	1

BSTFA w/1% TMCS Bis(trimethylsilyl)trifluoroacetamide w/1% trimethylchlorosilane

Part #	Size	Units per pack
SBSTFA-1-1	1 gm vial	10
SBSTFA-1-10	10 gm vial	1
SBSTFA-1-25	25 gm vial	1
SBSTFA-1-100	100 gm vial	1

BSTFA w/10% TMCS Bis(trimethylsilyl)trifluoroacetamide w/10% trimethylchlorosilane

Part #	Size	Units per pack
SBSTFA-10-1	1 gm vial	10
SBSTFA-10-10	10 gm vial	1
SBSTFA-10-25	25 gm vial	1
SBSTFA-10-100	100 gm vial	1

MSTFA N-Methyl-N-trimethylsilyltrifluoroacetamide

Part #	Size	Units per pack
SMSTFA-0-1	1 gm vial	10
SMSTFA-0-10	10 gm vial	1
SMSTFA-0-25	25 gm vial	1
SMSTFA-0-100	100 gm vial	1

MSTFA w/1% TMCS N-Methyl-N-trimethylsilyltrifluoroacetamide w/1% Trimethylchlorosilane

Part #	Size	Units per pack
SMSTFA-1-1	1 gm vial	10
SMSTFA-1-10	10 gm vial	1
SMSTFA-1-25	25 gm vial	1
SMSTFA-1-100	100 gm vial	1

MTBSTFA N-methyl-N-[tert-butyl-dimethylsilyl] trifluoroacetamide

Part #	Size	Units per pack
SMTBSTFA-0-1	1 gm vial	10
SMTBSTFA-0-10	10 gm vial	1
SMTBSTFA-0-25	25 gm vial	1
SMTBSTFA-0-100	100 gm vial	1

MTBSTFA w/1% TBDMCS N-methyl-N-[tert-butyl-dimethylsilyl] trifluoroacetamide w/1% Tert-butyl-dimethylchlorosilane

Part #	Size	Units per pack
SMTBSTFA-1-1	1 gm vial	10
SMTBSTFA-1-10	10 gm vial	1
SMTBSTFA-1-25	25 gm vial	1
SMTBSTFA-1-100	100 gm vial	1

MTBSTFA w/10% TBDMCS N-methyl-N-[tert-butyl-dimethylsilyl] trifluoroacetamide w/10% Tert-butyl-dimethylchlorosilane

Part #	Size	Units per pack
SMTBSTFA-10-1	1 gm vial	10
SMTBSTFA-10-10	10 gm vial	1
SMTBSTFA-10-25	25 gm vial	1
SMTBSTFA-10-100	100 gm vial	1

TMCS Trimethylchlorosilane

Part #	Size	Units per pack
STMCS-0-1	1 gm vial	10
STMCS-0-10	10 gm vial	1
STMCS-0-25	25 gm vial	1
STMCS-0-100	100 gm vial	1

Acylation Reagents

Acylation is the conversion of compounds with active hydrogens (such as –SH, –OH and –NH) into thioesters, esters and amides respectively by forming a carboxylic acid derivative. The primary use of acylation chemistry is to form compounds that chromatograph better and have a greater detectability than the parent molecule. For example, addition of a perfluoro group will improve the detectability of analytes if an electron capture detector is used.

PERFLUORO ACID ANHYDRIDES

MBTFA

(N-Methyl-bis[Trifluoroacetamide])

- This reacts with primary and secondary amines, hydroxyl and thiol groups under mild, nonacidic conditions.
- Produces very volatile derivatives of carbohydrates.
- Can be used to selectively acylate amines in the presence of hydroxyl and carboxyl groups that have been protected by silylation.

HFAA

(Heptafluorobutyric Acid Anhydride, HFBA)

- React readily with alcohols, phenols and amines producing stable volatile derivatives for TCD, FID, ECD and other detectors.
- It is suggested that fluoro alcohols (such as PFPOH an HFIP) be used to react with the acidic by-products of these to drive the reaction to completion.

PFAA

(Pentafluoropropionic Acid Anhydride, PFPA)

- React readily with alcohols, phenols and amines producing stable volatile derivatives for TCD, FID, ECD and other detectors.
- Commonly used in the determination of benzoylcegonine and opiates.
- Acidic by-products of this reaction must be removed before the derivative can be injected onto the GC.

TFAA

(Trifluoroacetic Acid Anhydride)

- React readily with alcohols, phenols and amines producing stable volatile derivatives for TCD, FID, ECD and other detectors.
- Most reactive of all the perfluoroacid anhydrides and frequently used to identify methamphetamine.

TFAI

(Trifluoroacetylimidazole)

- React readily with alcohols, phenols and amines producing stable, volatile derivatives for TCD, FID, ECD and other detectors.
- Offer considerable advantages over the anhydrides for the preparation of perfluoroacyl derivatives; the reactions are smooth, quantitative and produce no acid by-products.
- Principal by-product is imidazole (relatively inert).

MBTFA N-Methyl-Bis-(Trifluoroacetamide)		
Part #	Size	Units per pack
SMBTFA-0-1	1 gm vial	10
SMBTFA-0-10	10 gm vial	1
SMBTFA-0-25	25 gm vial	1
SMBTFA-0-100	100 gm vial	1

HFAA Heptafluorobutyric acid anhydride		
Part #	Size	Units per pack
SHFAA-0-1	1 gm vial	10
SHFAA-0-10	10 gm vial	1
SHFAA-0-25	25 gm vial	1
SHFAA-0-100	100 gm vial	1

PFAA Pentafluoropropionic acid anhydride		
Part #	Size	Units per pack
SPFAA-0-1	1gm vial	10
SPFAA-0-10	10 gm vial	1
SPFAA-0-25	25 gm vial	1
SPFAA-0-100	100 gm vial	1

TFAA Trifluoroacetic acid anhydride		
Part #	Size	Units per pack
STFAA-0-1	1 gm vial	10
STFAA-0-10	10 gm vial	1
STFAA-0-25	25 gm vial	1
STFAA-0-100	100 gm vial	1

TFAI N-Trifluoroacetylimidazole		
Part #	Size	Units per pack
STFAI-0-1	1 gm vial	10
STFAI-0-5	5 gm vial	1

PIA Propionic Anhydride		
Part #	Size	Units per pack
SPIA-0-1	1 gm vial	10
SPIA-0-10	10 gm vial	1
SPIA-0-25	25 gm vial	1

Alkylation Reagents

Alkylation reactions replace active hydrogens by an aliphatic or aliphatic-aromatic (benzyl) group. The principal use of this mode of derivation is to improve upon the chromatography of compounds such as free organic acids. Alkylation reactions can form ethers, thioethers, thioesters, n-alkylamines, amides and sulfonamides. These derivatives possess excellent stability and can be stored for extended periods of time.

TMPAH

(0.2 M Trimethylanilinium Hydroxide in Methanol)

- Used for the methylation of barbiturates, sedatives, xanthenes, and alkaloids for GC.
- The derivatization of these compounds often can be done in the injector of the GC.

TMPAH 0.2 M Trimethylanilinium Hydroxide in Methanol		
Part #	Size	Units per pack
STMPAH-0-1	1 gm vial	10
STMPAH-0-10	10 gm vial	1
STMPAH-0-25	25 gm vial	1
STMPAH-0-100	100 gm vial	1

4 CB 4-Carboxyhexafluorobutyl Chloride		
Part #	Size	Units per pack
S4CB-0-1	1 gm vial	10
S4CB-0-10	10 gm vial	1
S4CB-0-25	25 gm vial	1

• Used in the derivatization of amphetamines.

Specialized Reagents

PFPOH

or

HFIP

(Pentafluoropropanol)

(Hexafluoro-2-propanol)

- Used in combination with the acid anhydrides to promote reaction and removal of acidic by-products.
- This reaction is especially used for carboxylic acids.
- The addition of fluorine atoms into the molecule greatly adds to the sensitivity of certain detectors (ECD).

PFPOH Pentafluoropropanol		
Part #	Size	Units per pack
SPFPOH-0-1	1 gm vial	10
SPFPOH-0-10	10 gm vial	1
SPFPOH-0-25	25 gm vial	1
SPFPOH-0-100	100 gm vial	1

HFIP Hexafluoro-2-propanol		
Part #	Size	Units per pack
SHFIP-0-1	1 gm vial	10
SHFIP-0-10	10 gm vial	1
SHFIP-0-25	25 gm vial	1
SHFIP-0-100	100 gm vial	1

SELECTRA-SIL[®] Derivatizing Reagents

**These reagents are manufactured by
UCT to exacting standards of purity and consistency.**



Benefits of Derivatization:

- ✓ Improved chromatographic resolution - increased volatility - reduced intermolecular hydrogen bonding - separation of structurally similar compounds.
- ✓ Improved mass spectral characteristics - produces higher mass fragments - greater S/N (signal to noise ratio) - more unique masses- increased abundance/sensitivity of molecular ions.
- ✓ Improved thermal stability of some compounds - reduces thermal degradation - allows higher temperatures to speed analysis.
- ✓ Increased instrument and lab productivity - fewer reinjections or repeats due to peak tailing - high confidence in analyte identification and quantitation - easy to perform - inert by-products of derivatization will not degrade capillary column performance.

Derivatizing reagents are sold bottled in airtight septum vials blanketed with nitrogen to maintain their activity.

Contact with moisture can greatly reduce reactivity. **Protect from air and moisture.** Keep bottle tightly sealed when not in use.

It is critical that pipettes, glassware, vials etc be free of water or alcohol before derivatization.

**United Chemical Technologies offers their 100% satisfaction guarantee.
If for any reason you are dissatisfied with our product,
UCT will offer a replacement or refund.**

SELECTRA-SIL[®]

Solvents for Derivatization Reactions

The addition of solvents to derivatization reactions is a critical step in the reaction process. Solvents are used to solubilize the analyte and promote reaction conditions that will improve the yield of the reaction. Listed below are the most common solvents used in this process:

<u>Solvent</u>	<u>Part Number</u>	<u>Size</u>	<u>Unit</u>
Acetonitrile (ACN) <ul style="list-style-type: none">■ Acetonitrile is used as a solvent to promote silylation reactions that ionization are involved.■ It is a polar solvent.	SACN-0-50	50 mL vial	1
Dimethylformamide (DMF) <ul style="list-style-type: none">■ Used as a common solvent for most organic materials.■ This solvent is desired if a slow rate of evaporation is required.■ Has been termed the universal solvent, it is a moderately polar solvent	SDMF-0-50	50 mL vial	1
Dimethyl Sulfoxide (DMSO) <ul style="list-style-type: none">■ A moderately polar solvent with high boiling point.	SDMSO-0-50	50 mL vial	1
Pyridine <ul style="list-style-type: none">■ Good solvent for many organic materials and reactions requiring a nucleophilic environment.■ A moderately polar solvent.	SPYR-0-50	50 mL vial	1
Tetrahydrofuran (THF) <ul style="list-style-type: none">■ Solvent for polymers, reaction media for Grignard reactions and in plastic films for packaging.■ Can form explosive peroxides if distilled.■ Miscible with many solvents, has a low boiling point and is a non-polar solvent.	STHF-0-50	50 mL vial	1

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Our customer service staff will process all orders from 8:00 a.m. to 5:00 p.m. Eastern Standard Time, Monday through Friday. After 5:00 p.m. EST, voice mail will be available for messages and orders. We will gladly return your calls as soon as possible.

PLACING AN ORDER

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ORDERING INFORMATION

PRICES AND TERMS

Our prices are subject to change without notice. The price in effect when we receive your order will apply. All prices are in US Dollars and are F.O.B. Lewistown, PA 19007. Terms of payment are net 30 days.

MINIMUM ORDERS

We welcome all orders; therefore, we do not have a minimum order requirement.

When ordering, please include your purchase order number, complete "Ship To" and "Bill to" address, catalog number, quantity, and description of product(s). Also include your name and phone number where we can contact you if we have any questions concerning your order.

SHIPMENTS

Normal processing is within 24 hours after receipt of an order. Unless special shipping requests have been made, our trained staff will send all orders Regular UPS. The appropriate shipping charges (freight & insurance costs) will be added to the invoice, unless otherwise instructed by the customer.

SPECIAL PRICING

We offer special pricing for volume purchases and standing orders. These discounts apply to bonded phase extraction column purchases only. Please call a sales representative for more information on special pricing qualifications.

RETURN POLICY

Our Quality Manager will handle all returns. Before returning merchandise, please call to obtain a return authorization number from the quality manager. We will need to know the reason for the return, date of purchase, purchase order number and invoice number in order to issue a return authorization number. Return merchandise must be received before a credit can be issued. Returns will not be accepted after 90 days. A restocking fee of 25% of products list price or a minimum of \$25.00 (which ever is greater) will be charged on all returns.

WARRANTY

All products manufactured by United Chemical Technologies, Inc. are guaranteed against defects in materials and workmanship for a period of 90 days after shipment. United Chemical Technologies, Inc. will replace any items that prove to be defective during this time period.

The exclusive remedy requires the end user to first advise United Chemical Technologies, Inc. of the defective product by phone or in writing. Secondly, the defective product must be returned within 30 days after proper approval from our Quality Manager. All returns must indicate the purchase order number, the lot number and the shipping date. United Chemical Technologies, Inc. total liability is limited to the replacement cost of UCT products.

This warranty does not apply to damage resulting from misuse.