Innovative biochemistry solutions from Interchim

### Derivatization reagents

<table>
<thead>
<tr>
<th>Acylation Reagents</th>
<th>Silylation Reagents</th>
</tr>
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<tbody>
<tr>
<td>Acylating amines, hydroxyl, thiol groups, carbohydrates. MBTFA, TFAA, HFBI…</td>
<td>For excellent chromatographic separations. BSA, BSTFA, HMDS, MAX, MSTFA, MTBSTFA</td>
</tr>
<tr>
<td><strong>Alkylation Reagents</strong></td>
<td><strong>Silylation Grade Solvents</strong></td>
</tr>
<tr>
<td>Substitution of active hydrogens with aliphatic or aliphatic-aromatic groups. BF3, TMPAH, DMFDMA, PFBBr</td>
<td>Manufactured to meet your exacting silylation needs.</td>
</tr>
</tbody>
</table>

**Acylation Reagents**

**Acylation**

Provides derivatives that are better suited to chromatography and give a better response than the parent compound. Delivers enhanced detectability by electron capture detector (ECD).

**MBTFA**

MBTFA is for trifluoroacylating primary and secondary amines, hydroxyl and thiol groups and carbohydrates.

- TS-49700 10 x 1mL ampules
- TS-49703 25mL
- TS-49704 100mL
- TS-49701 5g

- Reacts under nonacidic conditions
- Principle byproduct from the derivatization reaction is N-methyltrifluoroacetamine, which is stable, volatile and does not present problems in subsequent GC
- 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

**Pentafluoropropanol**

an acylation reagent purified for GC/MS applications.

- TS68195, 10x1ml amps

- Addition of fluorine atoms into compounds greatly enhances the sensitivity of certain detectors for all those materials
- Carboxylic acids can be derivatized using a two-step reaction involving reaction with anhydride, followed by a fluorinated alcohol

**Perfluoro Acid Anhydrides (TFAA, PFAA and HFAA)**

highly purified for optimal preparation of fluoracyl derivatives.

- TS-67363 Trifluoroacetic Acid Anhydride; 100g
- TS-65193 Pentafluoropropionic Acid Anhydride; 10 x 1mL ampules
- TS-65192 Pentafluoropropionic Acid Anhydride; 25g
- TS-65191 Pentafluoropropionic Acid Anhydride; 100g
- TS-63164 Heptafluorobutyric Acid Anhydride; 10 x 1mL ampules

- Used to prepare fluoracyl derivatives for GC/MS
- Produce stable volatile derivatives for FID and ECD techniques
Perfluoroacylimidazoles HFBI and TFAI offer effective acylation of hydroxyl groups and primary and secondary amines.

- TS-44211 HFBI; 5g
- TS-48882 TFAI; 10 x 1mL ampules

- Reactions are smooth, quantitative and produce no acid byproducts
- Principal by-product, imidazole, is relatively inert
- Excellent for FID and ECD techniques
- Derivatives are volatile, despite size of group
- Closely bound fluorines contribute to stability

Recommended for:

- Use in bifunctional derivatization schemes and in exchange reactions where TMS derivatives are converted to HFB derivatives
- Hydroxyl groups of catecholamines are derivatized with TMSI, followed by conversion of the amines to acylamides with HFBI
- Tryptamine and metabolites present in spinal fluid have been analyzed by ECD using HFBI

**Alkylation Reagents**

**BF3-Methanol**

- Provides convenient, fast and quantitative esterification of fatty acids.
- TS-49370 100mL
  - Supplied in septum-sealed Hypo-Vial Sample Storage Vial for convenient syringe removal
  - Consists of 14% BF3, MW 67.82, and 86% CH3OH, MW 32.04

**MethElute® Reagent (TMPAH)**

- Provides accurate, sensitive on-column methylation.
- TS-49300 10mL
- TS-49301 12 x 1mL
  - 0.2M trimethylanilinium hydroxide (TMPAH) in methanol solution
  - For quantitative methylation and detection of barbituates, sedatives, xanthine bases, phenolic alkaloids and phenylthion by gas chromatography
  - Single quantitative peak for each substance
  - When reagent is heated with drug-containing extracts, serum or urine, those drugs containing reactive amino, hydroxyl and carboxyl functions will be methylated at the reactive sites
  - Comparable to or better than UV/TLC method (when phenobarbitol and phenytoin are present, GC is superior to UV/TLC)
  - Coefficient of variation is 5% or less
  - Detects barbiturates to 0.2mg/dL

**Methylate Reagent (DMFDMA)**

- Offers easy, effective preparation of methyl esters from fatty acids and amino acids.
- TS-49350 For 0.53mm I.D. Columns; 0.8mm Ferrule I.D.

- Advantages for preparation of methyl esters for gas chromatography:
  - Speed: the reaction is complete upon dissolution (except long chain solid acids)
  - No water washing, extraction or concentration of derivatives required
  - No water formed
  - Quantitation: quantitative yields are obtained when the reagent and sample are injected without prior mixing
  - Convenient: ready-to-use reagent contains 2mEq/mL pyridine
  - Stored in hypovials, stable at RT

**Pentafluorobenzyl Bromide (PFBBr)**

- For electron capture GC analysis of carboxyl acids, phenols and sulfonamides. Analysis of trace organics in asphalt.
- TS-58220 5g
  - Fast reaction times for extraction alkylation technique: ~20 minutes
  - Derivatives are highly EC-sensitive, making them useful in low-level determinations of fatty acids
  - Analysis of trace organics in asphalt

**Silylation Reagents**

Trimehtilsilyl and t-butyldimethyl derivatives offering excellent thermal stability. They improve chromatography separations.

**BSA**

- The perfect reagent for volatile TMS derivatives.
- TS-38836 10 x 1mL
- TS-38839 100g
- TS-38838 25g
  - Highly reactive trimethylsilyl donor that reacts quantitatively to form volatile, stable TMS derivatives
  - Reacts quickly and quantitatively under mild conditions with a variety of compounds
  - Derivatizes alcohols, amines, amides, carboxylic acids, phenols, sterols, biogenic amines and alkaloids
**BSTFA**

provides excellent chromatographic separations.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Weight</th>
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<tr>
<td>TS-38830</td>
<td>BSTFA 10 x 1mL ampules</td>
<td>10 x 1mL</td>
</tr>
<tr>
<td>TS-38828</td>
<td>BSTFA 25g</td>
<td>25g</td>
</tr>
<tr>
<td>TS-38829</td>
<td>BSTFA 100g</td>
<td>100g</td>
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</tbody>
</table>

BSTFA is a powerful thimethylsilyl donor, with donor strength that is comparable to its unfluorinated analog BSA [N,O-Bis(trimethylsilyl)acetamide]. BSTFA reacts to replace labile hydrogens on a wide range of polar compounds with a Si(CH3)3 group. This physical characteristic is particularly useful in the gas chromatography of some lower boiling TMS-amino acids and TMS Krebs cycle acids.

- Increased volatility of reaction byproducts mono(trimethylsilyl)trifluoroacetamide and trifluoroaceticamid over corresponding nonfluorinated compounds from BSA
- Increased volatility makes it possible to derivatize smaller molecules with which the TMS derivatives elute with the byproducts from BSA

**BSTFA + TMCS**

well-suited for difficult-to-silylate compounds.

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<tr>
<td>TS-38831</td>
<td>BSTFA +1% TMCS 10 x 1mL ampules</td>
<td>10 x 1mL</td>
</tr>
<tr>
<td>TS-38832</td>
<td>BSTFA +1% TMCS 10g</td>
<td>10g</td>
</tr>
<tr>
<td>TS-38833</td>
<td>BSTFA +1% TMCS 25g</td>
<td>25g</td>
</tr>
<tr>
<td>TS-38834</td>
<td>BSTFA +1% TMCS 100g</td>
<td>100g</td>
</tr>
<tr>
<td>TS-38840</td>
<td>BSTFA +10% TMCS 10 x 1mL ampules</td>
<td>10 x 1mL</td>
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</table>

- Excellent for derivatizing fatty acid amides, slightly hindered hydroxyls and other compounds
- Catalyzed formulation is stronger than BSTFA alone

**HMDS (Hexamethyldisilazane)**

greatly extends the practical range of GC, improving chromatographic results in the silylation of sugars and related substances.

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<tr>
<td>TS-84770</td>
<td>HMDS 25g</td>
<td>25g</td>
</tr>
<tr>
<td>TS-84769</td>
<td>HMDS 100g</td>
<td>100g</td>
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</tbody>
</table>

- Suitable for deactivating and coating chromatographic supports
- Monofunctional, making polymerization not possible and eliminating surface moisture

**Methoxamine (MOX) Reagent**

useful for preparing oximes of steroids and ketoacids prior to silylation.

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<tr>
<td>TS-45950</td>
<td>Hypo-Vial Container; 10mL</td>
<td>10mL</td>
</tr>
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</table>

- 2% methoxamine-HCl (M.W. 83.51) in pyridine
- Prevents formation of multiple derivatives when enols are present during silylation
- Supplied in amber Hypo-Vial Sample Storage Vial with septum and crimp top

**MSTFA and MSTFA 1% TMCS**

offer maximum volatility.

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<tr>
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<th>Description</th>
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<tr>
<td>48910</td>
<td>MSTFA 10 x 1mL ampules</td>
<td>10 x 1mL</td>
</tr>
<tr>
<td>48911</td>
<td>MSTFA 10g</td>
<td>10g</td>
</tr>
<tr>
<td>48913</td>
<td>MSTFA 25mL</td>
<td>25mL</td>
</tr>
<tr>
<td>48914</td>
<td>MSTFA 100mL</td>
<td>100mL</td>
</tr>
<tr>
<td>48915</td>
<td>MSTFA +1% TMCS 10 x 1mL ampules</td>
<td>10 x 1mL</td>
</tr>
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</table>

- Trimethylsilyl donor strength comparable to BSA and BSTFA
- Reacts to replace labile hydrogens on a wide range of polar compounds with a Si(CH3)3 group
- Used to prepare volatile and thermally stable derivatives for GC and MS
- Volatile byproduct N-methyltrifluoroacetamide, has an even lower retention time than MSTFA
- Often TMS derivatives of small molecules can be analyzed when derivatized with MSTFA because the byproducts and the reagent itself usually elute with the solvent front
- Addition of TMCS aids derivatization of amides, secondary amines and hindered hydroxyls not derivatized by MSTFA alone

**MTBSTFA and MTBSTFA+1% TBDMS**

stable TBDMS (tert-butyldimethylsilyl) derivatization of hydroxyl, carboxyl, thiol and primary and secondary amines.

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<tr>
<td>TS-48920</td>
<td>MTBSTFA 5mL ampules</td>
<td>5mL</td>
</tr>
<tr>
<td>TS-48927</td>
<td>MTBSTFA +1% TBDMS 10 x 1mL ampules</td>
<td>10 x 1mL</td>
</tr>
</tbody>
</table>

- Derivatizes hydroxyl, carboxyl, thiol and primary and secondary amines
- Typical yields are >96%
- Provides TBDMS ethers that are 104 times more stable to hydrolysis than TMS ethers
- Reaction byproducts are neutral and volatile
- Derivatives have a high molecular concentration at M-57
- Silylating potential increased by adding 1% TBDMS
TMCS (Trimethylchlorosilane)  
an excellent catalyst for difficult-to-silylate compounds.

TS-88530  25g

- Excellent adjunct for forming trimethylsilyl ethers for GC determinations
- Used to prepare TMS derivatives of organic acids

TMSI (N-Trimethylsilylimidazole)  
the strongest silylator available for carbohydrates and steroids.

TS-88623  TMSI (trimethylsilylimidazole); 10 x 1mL ampules
TS-88626  TMSI (trimethylsilylimidazole); 25g
TS-88626  TMSI (trimethylsilylimidazole); 100g

- Reacts quickly and smoothly with hydroxyls and carboxylic acids but not with amines
- Especially useful in multiderivatization schemes for compounds containing both hydroxyl and amine groups
- Used in the derivatization of alcohols, phenols, organic acids, steroids, hormones, glycols, nucleotides and narcotics
- Excellent for C1 through C5 fatty acids in serum and urine

Tri-Sil BP (BSA:pyridine) Reagent  
derivatizes alcohols, phenols, organic acids, aromatic amides and amines.

TS-49012  25mL

Excellent for unhindered steroids, but not recommended for carbohydrates. Reacts with:

- Alcohols, phenols, some enols and other hydroxyl and polyhydroxyl compounds to form trimethylsilyl esters
- Organic acids to form trimethylsilyl esters
- Aromatic amides to form N-trimethylsilyl derivatives
- Amino acids to form both N- and O-trimethylsilyl derivatives
- Amines to form N-trimethylsilyl derivatives

Silylation Grade Solvents

TS-20062  Acetonitrile, 50mL
TS-20672  Dimethylformamide (DMF); 50mL
TS-20684  Dimethylsulfoxide (DMSO); 50mL
TS-27530  Pyridine; 50mL
TS-27860  Tetrahydrofuran (THF); 50mL

- Purified, dried and packaged under nitrogen in convenient 50mL Hypo-Vial Sample Storage Vials
- Supplied with elastomer septa, allowing immediate access to the sample without exposure to moisture and oxygen
- Use polar solvents (acetonitrile, dimethylformamide, dimethylsulfoxide, pyridine, tetrahydrofuran) to facilitate reactions; nonpolar organic solvents may be used, but they will not accelerate the rate of reaction

Recommended to:

∞ Avoid water or alcohol because TMS reagents react with active hydrogen; avoid enolizable ketones
∞ Use dimethylformamide for steroids and other large molecules
∞ Use dimethylsulfoxide to prepare TMS derivatives of tertiary alcohols and some compounds with reluctant solubility in other silylation solvents
∞ Pyridine is an excellent solvent and reaction medium for MS reactions and is an HCl acceptor in reactions involving organochlorosilanes
∞ Other commonly used solvents include tetrahydrofuran and acetonitrile

Multi Maleimide agents

Sulfhydryl reactive tris- and tetra maleimide reagents for preparing multimeric aggregates of polypeptides


TMAE (Mal-3)  
tris-(2-Maleimidoethyl)amine; MW: 386.36; spacer: 10.3 Å

See other multifunctional crosslinkers in the technical sheet

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- SAM reagents (Self-Assembled Monolayers for surface modification)
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- FluoProbes labeling agents
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