ISERA

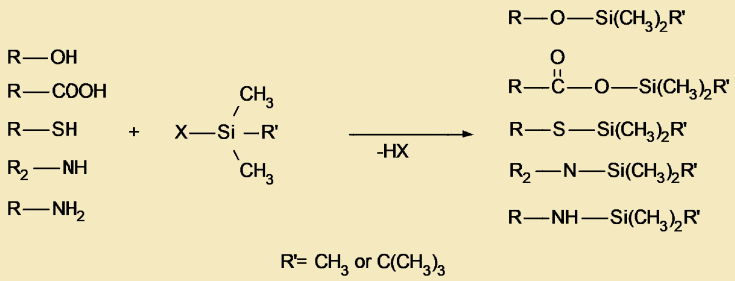
Derivatization Reagents for Gas Chromatography

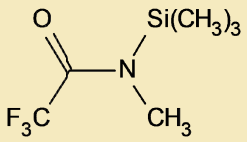
Silylation

The conversion of functional groups containing active hydrogen atoms with trialkylsily groups is an ubiquitous reaction and commonly used. Silylation reactions can be applied for derivatization of **alcohols, phenols, carboxylic acids, thiols, amines** and **amides**. The corresponding alkyl silyl compounds (mostly trimethylsilyl / TMS) are obtained easily and in many cases quantitatively.

Water as a protic solvent also reacts with silylation reagents. Hence the conversion has to take place in aprotic solvents.

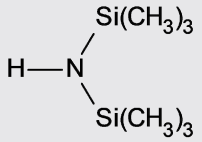
Reactions





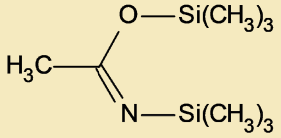
MSTFA

N-Methyl-*N*-trimethylsilyltrifluoroacetamide



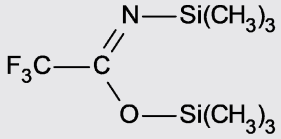
HMDS

Hexamethyldisilazane



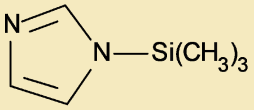
BSA

N,O-Bis(trimethylsilyl)acetamide



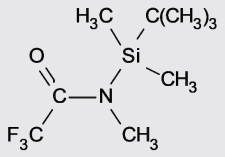
BSTFA

N,O-Bis(trimethylsilyl)trifluoroacetamide



TMSI

Trimethylsilylimidazole



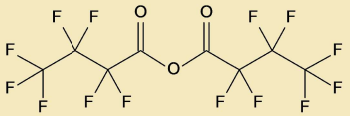
MTBSTFA

N-Methyl-*N*-*tert*-butyldimethylsilyl-trifluoroacetamid

Acylation

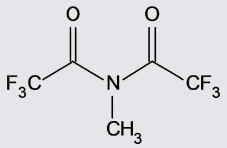
In acylation reactions active hydrogen atoms from **OH-, NH2-, NH-** or **SH-groups** are substituted by acyl groups (-CO-R).

This reaction is therefore used for derivatization of **alcohols, amines** and **thiols**. Fluorinated acylation reagents are more reactive and therefore favoured in many cases. Furthermore, their reaction products show much higher sensitivity e.g. when using Electron Capture Detectors (ECD).



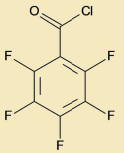
HFBA

Heptafluorobutyric acid anhydride



MBTFA

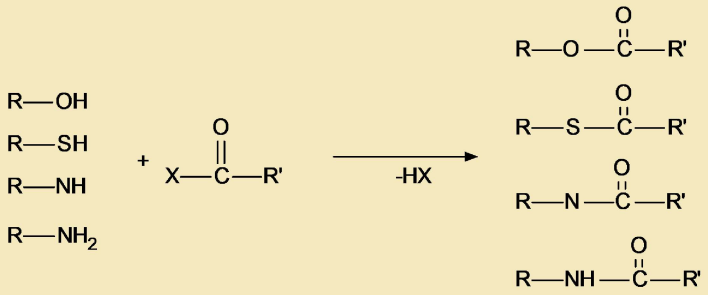
N-Methylbis(trifluoroacetamide)

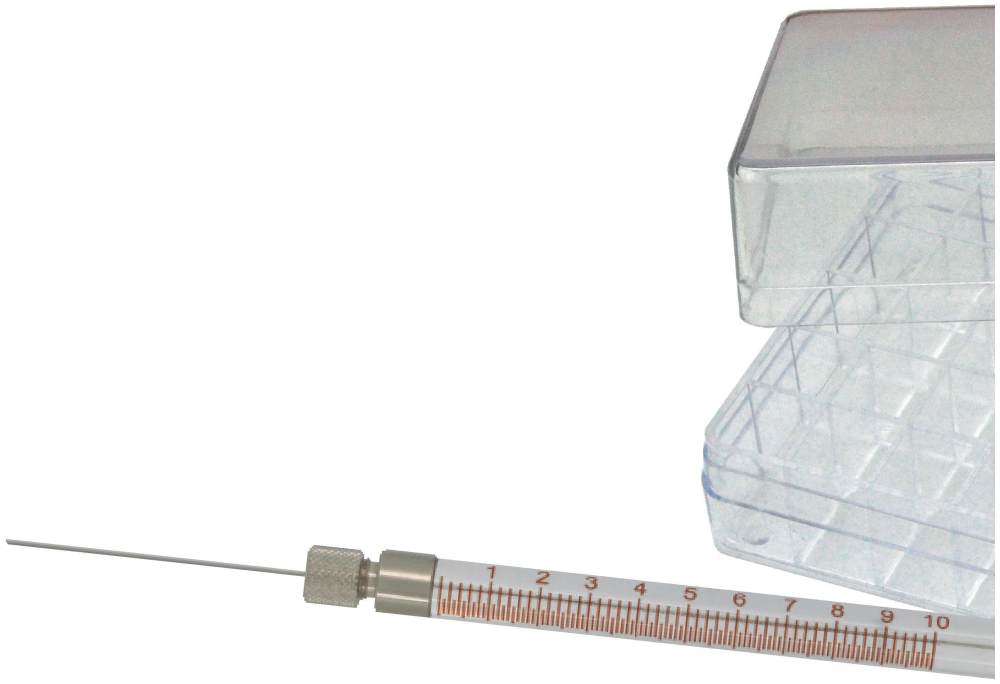


PFBC

Pentafluorbenzoyl chloride

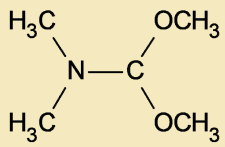
Reactions





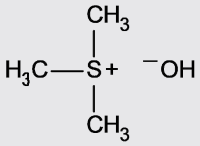
Alkylation

Acidic hydroxy groups (e.g. from **carboxylic acids** or **phenols**) and **amines** can be predominantly derivatized by alkylation. Methylation reagents are commonly used and a substitution of active hydrogen atoms by methyl groups takes place. The resulting products are remarkably stable.



DMF-DMA

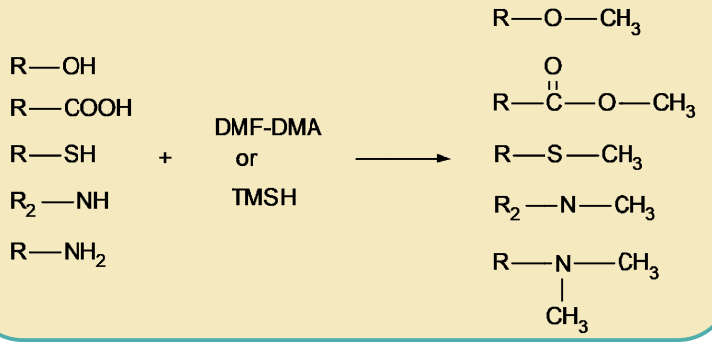
N,N-Dimethylformamide dimethyl acetal



TMSH

Trimethylsulfonium hydroxide

Reactions



Mixtures

There are many cases known where mixtures of derivatization reagents or solutions with added activating reagents enhance the reaction efficiency in comparison to the sole reagent. Therefore, ISERA offers several pre-assembled reagent mixtures.

Silyl-271

BSA – HMDS – TMSI, 2 : 7 : 1

Sily-1139

TMSI – Pyridine, 11 : 39

Silyl-21

HMDS – TMCS, 2 : 1

Sily-991

BSTFA – TMCS, 99 : 1

Silyl-2110

HMDS – TMCS – Pyridine, 2 : 1 : 10

Kits

Which is the best derivatization reagent for my analytes? Which reagent result in a complete reaction? Which reagent leads to defined and reproducible results?

ISERA's derivatization kits with different reagents are ideal for using in research applications or method development.

Silylation Kit

BSA | BSTFA | MSTFA | TMSI

Silyl-271 | Silyl-991

Acylation and Alkylation Kit

MBTFA | HFBA | TMSH | DMF-DMA

Development Kit

BSTFA | MBTFA | TMSH

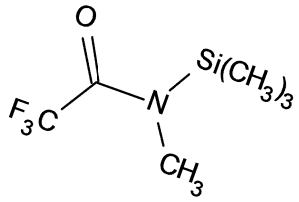
Derivatization Reagents for GC

The gas chromatography is one of the most powerful modern analytical methods. The usage of derivatization reagents can extend the range of application significantly, particularly because many analytes are only after derivatization accessible for GC analysis.

Amongst better evaporation properties in many cases by derivatization also better separations or enhanced sensitivities can be achieved.

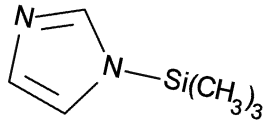
TMSH

MSTFA



- **Extended range of GC applications**
- **Better separations**
- **Higher sensitivities**
- **Advantageuos chromatographic properties**

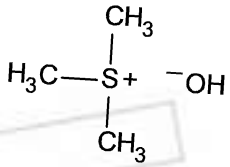
HFBA



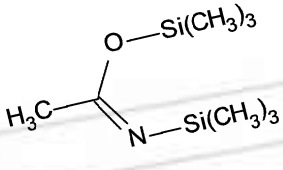
BSA

PFBC

Silyl-991



BSTFA



Silyl-271

DMF-DMA

TMSI

MBTFA

ISERA GmbH
Kreuzauer Str. 46
52355 Dueren, Germany

Telephone +49-(0)2421-972854-1
Email info@isera.de
Visit us online at www.ISERA.de