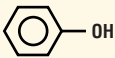


Table 2. Derivatization Reagents for Specific Functional Groups

Functional Group	Procedure	Reagent	Derivative	Notes	
Amides $\begin{array}{c} \text{O} \\ \\ -\text{C}-\text{NH}_2 \end{array}$ Primary	Silylation	BSA	TMS Amides	Difficult to form due to steric hindrance	
		BSTFA	TMS Amides		
		BSTFA+TMCS	TMS Amides		TMCS used as a catalyst
	$\begin{array}{c} \text{O} \\ \\ -\text{C}-\text{NHR} \end{array}$ Secondary	Acylation	MSTFA	TMS Amides	Reaction byproducts more volatile
			MSTFA+TMCS	TMS Amides	
			Tri-Sil® Reagents	TMS Amides	
Amines $\begin{array}{c} \text{H} \\ \\ -\text{C}-\text{NH}_2 \\ \\ \text{H} \end{array}$ Primary	Silylation	MTBSTFA	TBDMCS Amides	Difficult to form; very stable TBDMCS aids derivatization	
		MTBSTFA+TBDMCS	TBDMCS Amides		
		MethElute™ Reagent	Methyl Amides		On-column derivatization especially for drugs
	$\begin{array}{c} \text{H} \\ \\ -\text{C}-\text{NHR} \\ \\ \text{H} \end{array}$ Secondary	Silylation	MBTFA	Trifluoroacetamides	Good for trace analysis with ECD
			TFAA	Trifluoroacetamides	
			TFAI	Trifluoroacetamides	
Acylation		PFAA	Pentafluoropropionamides	Good for ECD detection	
		HFBA	Heptafluorobutyamides		
		HFBI	Heptafluorobutyamides		
Carbohydrates $(\text{CH}_2\text{OH})_n$	Silylation	MethElute™	Methyl Amides	On-column derivatization for specific drugs	
		MSTFA	TMS		
		TMSI	TMS	Can be used with some syrups	
	Acylation	Tri-Sil® Reagents	TMS		
		MBTFA	Trifluoroacetates	Volatile derivatives of mono-, di- and trisaccharides	
		TFAI	Trifluoroacetates		
Carboxyl $\begin{array}{c} \text{O} \\ \\ -\text{C}-\text{OH} \end{array}$	Silylation	BSA	TMS	Easily formed, generally not stable, analyze quickly	
		BSTFA	TMS		
		BSTFA+TMCS	TMS		
		MSTFA	TMS		
		TMCS	TMS		Can be used with some salts
	Acylation	TMSI	TMS		
		Tri-Sil® Reagents	TMS		
		MTBSTFA	TBDMCS	More stable than TMS derivatives TBDMCS aids derivatization	
		MTBSTFA+TBDMCS	TBDMCS		
		PFBBr	Pentafluorobenzyl Esters	Used in EC detection & UV, MS	
Hydroxyl-OH $\text{R}-\text{OH}$ Alcohols	Silylation	BF ₃ -Methanol	Methyl Esters	Best for large samples of fatty acids	
		Methyl-8® Reagent	Methyl Esters	Fatty acids and amino acids	
		MethElute™ Reagent	Methyl Esters	On-column derivatization	
		PFAA+Pentafluoropropanol	Pentafluoropropyl Ester	Drug analysis	
		BSA	TMS	Most often used derivatives	
	Acylation	BSTFA	TMS	Good thermal stability	
		BSTFA+TMCS	TMS	Poor hydrolytic stability	
		HMDS	TMS	Weak donor usually used with TMCS	
		MSTFA	TMS		
		MSTFA+TMCS	TMS		
 Phenols	Silylation	TMCS	TMS	Weak donor usually used with HMDS; can be used with salts	
		TMSI	TMS	Can be used with syrups	
		Tri-Sil® Reagents	TMS		
		MTBSTFA	TBDMCS	More stable than TMS, good MS fragmentation patterns	
		MTBSTFA+TBDMCS	TBDMCS	TBDMCS aids derivatization	
	Acylation	MBTFA	Trifluoroacetates	Good for trace analysis with EDC	
		TFAA	Trifluoroacetates	Good for trace analysis with EDC	
		TFAI	Trifluoroacetates	Good for trace analysis with EDC	
		PFPI	Pentafluoropropionates	Good for trace analysis with EDC	
		PFAA	Pentafluoropropionates	Good for trace analysis with EDC	
Alkylation	HFBI	Heptafluorobutrates	Good for trace analysis with EDC		
	HFAA	Heptafluorobutrates	Good for trace analysis with EDC		
	PFBBr	Pentafluorobenzyl Ethers	With alkoxides only		