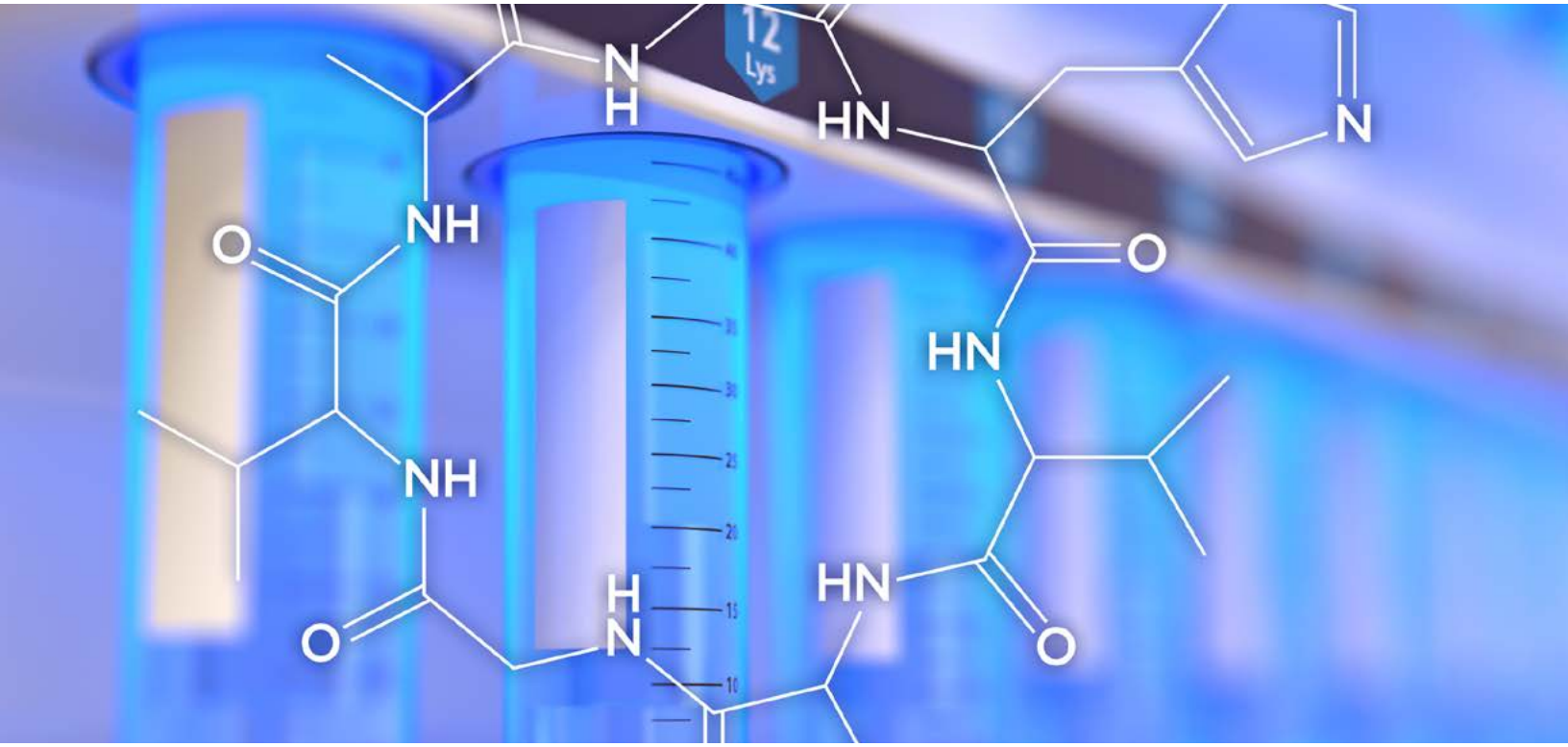
SPPS Reagents

For Peptide Synthesis



Amino Acids

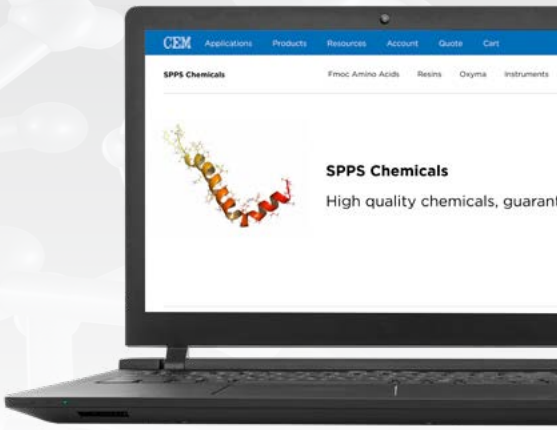
Activators

Resins

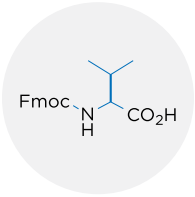
We Simplify Science

SPPS Chemicals

High quality chemicals, guaranteed.



CEM offers a complete suite of peptide synthesis reagents for optimized SPPS, whether using conventional synthesis or microwave irradiation. This includes a complete library of standard and unique, high-quality Fmoc amino acids, PEG and polystyrene resins, and the powerful Oxyma Pure activator. Using CEM's unique high-quality reagents provides the highest purity peptides, with CEM's innovative methodology and instrumentation.



Fmoc Amino Acids

Extremely high quality at an affordable price.

Overview

Using Fmoc amino acids of lower quality can have a significant impact on peptide purity and yield, resulting in hard to separate impurities and even total synthesis failures. CEM's Fmoc amino acids are the highest quality available on the market and provide the best purities and yields possible for peptide synthesis.

Standard Specifications

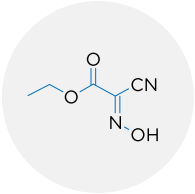
- HPLC purity ≥ 99.0%
- Enantiomeric purity ≥ 99.8%
- 100% fully synthetic amino acids
- Continuously used and tested in CEM's peptide synthesis laboratory

Pre-Weighed

Eliminate your weighing step by using amino acids that have been pre-weighed specifically for your Liberty system.

Full Library

A catalogue of Fmoc amino acids is available for synthesizing standard and modified peptides, for use with any peptide synthesizer.



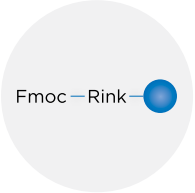
Oxyma Pure

The perfect activator for peptide synthesis at elevated temperatures.

Overview

Oxyma Pure used with DIC produces peptides with increased yield and decreased epimerization, when used as an alternative to HOBt.[1] This safe, non-explosive auxiliary nucleophile works with carbodiimide coupling strategies to provide the best results for a peptide synthesis. Additionally, the use of DIC/Oxyma avoids side reactions associated with high levels of base (≥ 1 equiv. DIEA), using onium salt methods such as HBTU/DIEA.

[1]R. Subirós-Funosas, et al. (2009) Chem. Eur. J., 15, 9394.

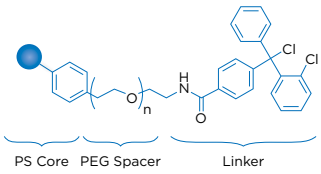


Resins

High quality, unique resins for SPPS.

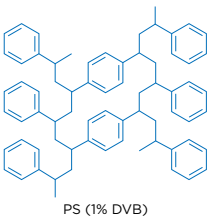
Overview

A full library of PEG and polystyrene resins for SPPS. CEM's SPPS resins are of the highest quality and optimized for the synthesis of standard and difficult peptides, with a variety of linkers.



ProTide™ Resins

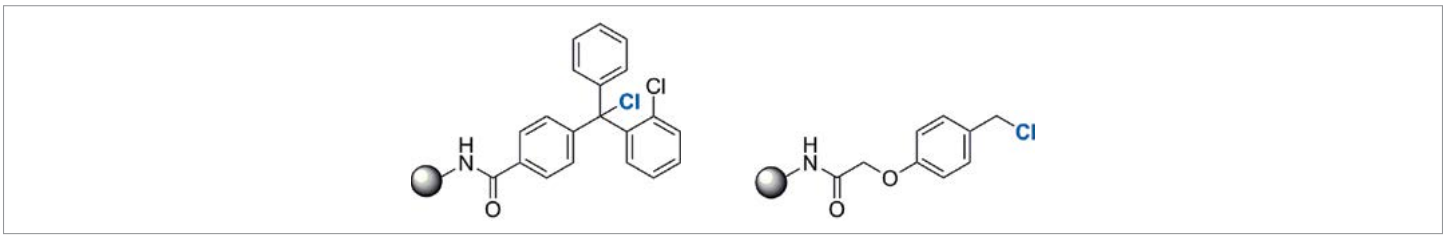
Based on a PEG-PS core with optimal swelling, ProTide is recommended for synthesis of very long and difficult peptides.



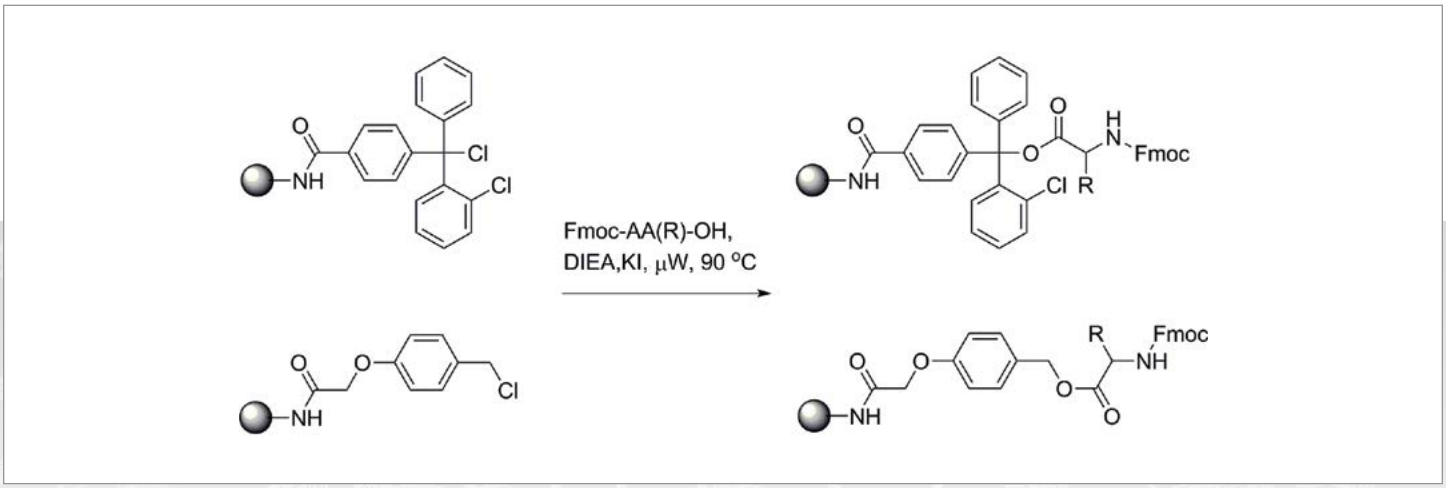
Polystyrene Resins

High quality, preloaded, polystyrene resins are great for synthesis of standard and difficult peptides.

Optimized PEG Resin Core with Cl-TCP(Cl) and Cl-MPA Universal Linkers



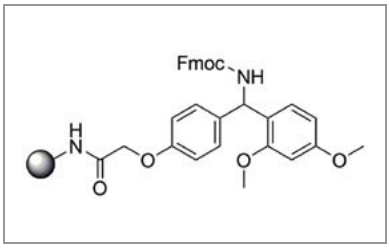
ProTide resins contain an ideal PEG and polystyrene core, leading to an optimized environment for the synthesis of difficult peptides, with excellent swelling properties. New Cl-TCP(Cl) and Cl-MPA linkers incorporated onto ProTide, eliminate the necessity for purchasing resins with preloaded C-terminal amino acids. The C-terminal amino acid reacts with the linker-chloride, in the presence of potassium iodide (KI)[1], N,N-diisopropylethylamine (DIEA), and microwave irradiation. The process is automatically carried out on CEM's microwave peptide synthesizers, using pre-programmed methods in the software. The result, any amino acid can be loaded on the resins in 10 minutes.



Key Advantages:

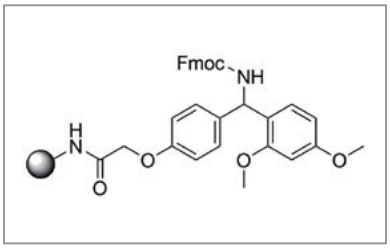
- Automated, high-temperature loading procedure complete in 10 min, whereas room temperature takes up to 24 hours
- Avoids coupling reagents; therefore, eliminating epimerization and dipeptide formation that can occur during loading
- No longer need to buy/store > 20 different, preloaded acid-linked resins
- Exhibit strong stability towards hydrolysis during storage and handling
- TCP(Cl) is hyperacid sensitive and will produce protected peptides with 1% TFA/DCM and further minimizes diketopiperazine and 3-(1-piperidinyl)alanine formation[2]

[1] Sandhya K., Ravindranath B. Tetrahedron Lett. 49, 2435 **2008**
[2] Heinlein C., Silva D., Tröster A., Schmidt J., Gross A., Unverzagt C. Angew. Chem. 50, 6406 **2011**



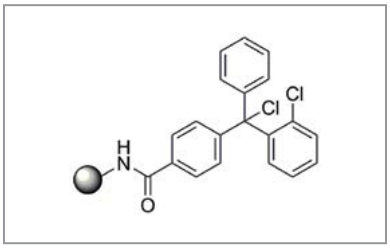
Rink Amide ProTide Resin (LL)

The ultimate resin recommended for longer and more difficult sequences of peptide amides. Based on ideal swelling properties from a TentaGel® core, incorporating PEG PS with a loading of 0.15 – 0.25 mmol/g. This resin is unmatched for the routine synthesis of difficult peptides, even > 75 amino acids.



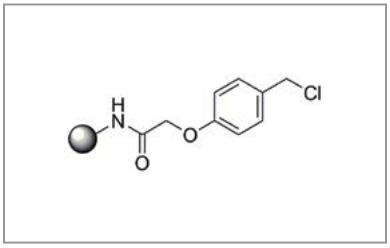
Rink Amide ProTide Resin

A powerful resin recommended for the synthesis of peptides with amide linkages < 30 amino acids. Based on ideal swelling properties from incorporating a PEG PS core with a loading of 0.55 - 0.8 mmol/g.



Cl-TCP(Cl) ProTide Resin

A powerful resin recommended for the synthesis of peptides with acid linkages < 30 amino acids. Based on ideal swelling properties from a TentaGel® core, incorporating PEG PS with a loading of 0.4 – 0.6 mmol/g. This resin features an activated chloride linker, allowing for attachment of the first amino acid in an unactivated form. This resin is recommended for protection of C-terminal cysteine and proline residues, due to its steric protection against diketopiperazine formation and 3-(1-Piperidinyl)alanine formation.



Cl-MPA ProTide Resin (LL)

The ultimate resin recommended for longer and more difficult sequences of peptide acids. Based on ideal swelling properties from a TentaGel® core, incorporating PEG PS with a loading of 0.15 – 0.25 mmol/g. This resin is unmatched for the routine synthesis of difficult peptides, even > 75 amino acids. This resin features an activated chloride linker, allowing for attachment of the first amino acid in an unactivated form.

Peptide Reagents List

Amino Acids

Natural Amino Acids	5.0 mmol (5 pk)	24 mmol (5 pk)	100 g	1 kg	Product Description
Fmoc-L-Ala-OH	A001-B5	A001-B24_5	A001-C	A001-D	Five (5) pack of pre-weighed centrifuge tubes or bulk container of amino acid.
Fmoc-L-Arg(Pbf)-OH	A002-B5	A002-B24_5	A002-C	A002-D	
Fmoc-L-Asn(Trt)-OH	A003-B5	A003-B24_5	A003-C	A003-D	
Fmoc-L-Asp(OtBu)-OH	A004-B5	A004-B24_5	A004-C	A004-D	
Fmoc-L-Cys(Trt)-OH	A005-B5	A005-B24_5	A005-C	A005-D	
Fmoc-L-Gln(Trt)-OH	A006-B5	A006-B24_5	A006-C	A006-D	
Fmoc-L-Glu(OtBu)-OH	A007-B5	A007-B24_5	A007-C	A007-D	
Fmoc-Gly-OH	A008-B5	A008-B24_5	A008-C	A008-D	
Fmoc-L-His(Boc)-OH*	A032-B5	A032-B24_5	A032-C	A032-D	
Fmoc-L-Ile-OH	A010-B5	A010-B24_5	A010-C	A010-D	
Fmoc-L-Leu-OH	A011-B5	A011-B24_5	A011-C	A011-D	
Fmoc-L-Lys(Boc)-OH	A012-B5	A012-B24_5	A012-C	A012-D	
Fmoc-L-Met-OH	A013-B5	A013-B24_5	A013-C	A013-D	
Fmoc-L-Phe-OH	A014-B5	A014-B24_5	A014-C	A014-D	
Fmoc-L-Pro-OH	A015-B5	A015-B24_5	A015-C	A015-D	
Fmoc-L-Ser(tBu)-OH	A016-B5	A016-B24_5	A016-C	A016-D	
Fmoc-L-Thr(tBu)-OH	A017-B5	A017-B24_5	A017-C	A017-D	
Fmoc-L-Trp(Boc)-OH	A018-B5	A018-B24_5	A018-C	A018-D	
Fmoc-L-Tyr(tBu)-OH	A019-B5	A019-B24_5	A019-C	A019-D	
Fmoc-L-Val-OH	A020-B5	A020-B24_5	A020-C	A020-D	

* His(Boc) also available in a 5 g size. Useful His variant for suppressing epimerization.

Amino Acid Kits	5.0 mmol	100 g	1 kg	Product Description
Set of 20 amino acids	AK02-B	AK02-C	AK02-D	One (1) pre-weighed centrifuge tube or bottle of each of the 20 naturally occuring amino acids

Aspartimide Prevention	5.0 mmol (5 pk)	24 mmol (5 pk)	1 g	5 g	100 g	1 kg	Product Description
Fmoc-L-Asp(OMpe)-OH	A030-B5	A030-B24_5	A030-A	A030-B	A030-C	A030-D	The bulky OMpe protecting group reduces aspartimide formation during Fmoc SPPS as compared to OtBu.
Fmoc-L-Asp(OtBu)-(Dmb)Gly-OH	N/A	N/A	A031-A	A031-B	Inquire	Inquire	This dipeptide with Dmb backbone protection completely inhibits aspartimide formation during Fmoc SPPS.

Phosphoamino Acids	1 g	5 g	Product Description
Fmoc-L-Ser(PO(Obzl)OH)-OH	A040-A	A040-B	Used for convenient incorporation of phosphorylated side chains. Ideal for use with CEM's patented DIC/Oxyma/DIEA coupling method for the Liberty Blue. Refer to CEM Application Note AP0117 for more information.
Fmoc-L-Thr(PO(Obzl)OH)-OH	A041-A	A041-B	
Fmoc-L-Tyr(PO(Obzl)OH)-OH	A042-A	A042-B	

Specialty Amino Acids	1 g	5 g	25 g	Product Description
Fmoc-L-Lys(Trt)-OH	N/A	N/A	A033-B5	These side chain protecting groups are more easily removed and scavenged, resulting in higher quality cleaved peptides.
Fmoc-L-Ser(Trt)-OH	N/A	N/A	A034-B5	
Fmoc-L-Thr(Trt)-OH	N/A	N/A	A035-B5	
Fmoc-Aib-OH	N/A	A036-B	A036-B5	An unusual amino acid used with Fmoc SPPS. Refer to CEM Application Note AP0150 for more information.
Fmoc-Ahx-OH	N/A	A037-B	A037-B5	Flexible spacer group used with Fmoc SPPS. Refer to CEM Application Note AP0125 for more information.
Fmoc-L-Lys(ivDde)-OH	N/A	A038-B	A038-B5	The ivDde group can be orthogonally removed allowing for selective branching on the lysine side chain group. Refer to CEM Application Note AP0134 for more information.
Fmoc-L-Lys(Fmoc)-OH	N/A	A039-B	A039-B5	This derivative allows for symmetrical branching on the lysine residue. Refer to CEM Application Note AP0125 for more information.
Fmoc-Lys(palmitoyl-Glu-OtBu)-OH	A043-A	A043-B	N/A	This derivative is a building block for glucagon-like peptide-1. Refer to CEM Application Note AP0170 for more information.
Fmoc-Glu(OAll)-OH	N/A	A047-B	A047-B5	Orthogonal protecting allyl side-chain can be removed under $Pd(PPh_3)_4$ and NMM conditions. On-resin functionalization of corresponding carboxyl group can occur on resin. Refer to CEM Application Note AP0176 for more information.
Fmoc-Cys(Mmt)-OH	N/A	A046-B	A046-B5	4-methoxytrityl (Mmt) is selectively cleaved on the solid phase with 1% TFA in DCM in the presence of scavenging groups (i.e. TIPS) while Trityl/tBu are left undisturbed. Refer to CEM Application Note AP0156 for more information.

(continued)

Specialty Amino Acids	1 g	5 g	25 g	Product Description
Fmoc-Lys(Alloc)-OH	N/A	A044-B	A044-B5	Alloc protected building block suitable for on-resin Lys modifications (ex, cyclic and branched peptides). Alloc is removed with $Pd(PPh_3)_4/CH_2Cl_3$ treatment while stable to Fmoc- and tBu/Boc/Trityl removal conditions. Refer to CEM Application Note AP0153 for more information.
Fmoc-Lys(Mmt)-OH	N/A	A045-B	A045-B5	4-methoxytrityl (Mmt) is selectively cleaved on the solid phase with mild acid such as chloroacetic acid or 1% TFA in DCM in the presence of scavenging groups (i.e. TIPS) while Trityl/tBu are left undisturbed. Refer to CEM Application Note AP0153 for more information.

Activators

Reagents	100 g	1 kg	Product Description
Oxyma Pure	S001-C	S001-D	Activator for use with carbodiimide reagents to reduce epimerization during coupling step.

ProTide PEG-PS Resins

Rink Amide Linker	1 g	5 g	25 g	100 g	Product Description
Fmoc Rink Amide ProTide Resin (LL)	R002-A	R002-B	R002-B5	R002-C	Loading: 0.15 – 0.25 mmol/g. Unmatched performance for routine synthesis of long (> 30 amino acids) or difficult peptide amides. **Can be used in place of PAL or other Rink Amide resins.**
Fmoc Rink Amide ProTide Resin	R003-A	R003-B	R003-B5	R003-C	Loading: 0.55 – 0.8 mmol/g. Ideal for peptide sequences <30 amino acids. **Can be used in place of PAL or other Rink Amide resins.**
Chloride Linker	**1 g**	**5 g**	**25 g**	**100 g**	**Product Description**
Cl-TCP(Cl) ProTide Resin	R005-A	R005-B	R005-B5	R005-C	Loading: 0.4 – 0.6 mmol/g. Universal loading, hyperacid sensitive linker for access to protected or deprotected peptide acids with short (< 30 amino acids) sequences. Designed to protect C-terminal cysteine and proline from side reactions. Ideal for use with CEM's patented DIC/Oxyma/DIEA coupling method for the Liberty Blue. **Can be used in place of trityl, 2-chlorotrityl, and HMPB resins.**
Cl-MPA ProTide Resin (LL)	R006-A	R006-B	R006-B5	R006-C	Loading: 0.15 – 0.25 mmol/g. Universal loading linker for routine synthesis of long (> 30 amino acids) or difficult peptide acids. **Can be used in place of Wang and HMPA resins.**

Preloaded Polystyrene Resins

Pre-loaded Wang PS (LL) resins	5g	25g	100 g	1 kg	Product Description
Fmoc-Ala-Wang PS (LL)	R100-B	R100-B5	R100-C	Upon Request	All resins are tested for dipeptide content and entantiomeric purity. Loading range is 0.25 – 0.30 mmol/g making them ideal for synthesizing difficult sequences, up to 40 AA in length. CEM's pre-loaded Wang resins are all characterized for D-amino acid content (<0.5 %) and dipeptide content (<0.2 %). Low loading capacity makes this resin ideal for preparation of long or difficult peptide acids.
Fmoc-Arg(pbf)-Wang PS (LL)	R101-B	R101-B5	R101-C	Upon Request	
Fmoc-Asn(trt)-Wang PS (LL)	R102-B	R102-B5	R102-C	Upon Request	
Fmoc-L-Asp(OtBu)-Wang PS (L)	R103-B	R103-B5	R103-C	Upon Request	
Fmoc-L-Gln(Trt)-Wang PS (LL)	R104-B	R104-B5	R104-C	Upon Request	
Fmoc-L-Glu(OtBu)-Wang PS (LL)	R105-B	R105-B5	R105-C	Upon Request	
Fmoc-Gly-Wang PS (LL)	R106-B	R106-B5	R106-C	Upon Request	
Fmoc-His(Boc)-Wang PS (LL)*	R119-B	R119-B5	R119-C	Upon Request	
Fmoc-L-Ile-Wang PS (LL)	R108-B	R108-B5	R108-C	Upon Request	
Fmoc-L-Leu-Wang PS (LL)	R109-B	R109-B5	R109-C	Upon Request	
Fmoc-L-Lys(Boc)-Wang PS (LL)	R110-B	R110-B5	R110-C	Upon Request	
Fmoc-L-Met-Wang PS (LL)	R111-B	R111-B5	R111-C	Upon Request	
Fmoc-L-Phe-Wang PS (LL)	R112-B	R112-B5	R112-C	Upon Request	
Fmoc-L-Ser(tBu)-Wang PS (LL)	R113-B	R113-B5	R113-C	Upon Request	
Fmoc-L-Thr(tBu)-Wang PS (LL)	R114-B	R114-B5	R114-C	Upon Request	
Fmoc-L-Trp(Boc)-Wang PS (LL)	R115-B	R115-B5	R115-C	Upon Request	
Fmoc-L-Tyr(tBu)-Wang PS (LL)	R116-B	R116-B5	R116-C	Upon Request	
Fmoc-L-Val-Wang PS (LL)	R117-B	R117-B5	R117-C	Upon Request	

	1g	5g	25g	100 g	1 kg	
Fmoc-Glu(Wang)-ODmab PS (LL)	R120-A	R120-B	Upon Request	Upon Request	Upon Request	Polystyrene resin core attached to the side chain of Glu using the Wang linker. Ideal for head-to-tail cyclic peptides. Dmab is removed on the solid phase using hydrazine in DMF.
Fmoc-Glu(Wang)-OAll PS (LL)	R121-A	R121-B	Upon Request	Upon Request	Upon Request	Reliable and cost effective polystyrene resin core attached to the side chain of Glu using the Wang linker. Ideal for head-to-tail cyclic peptides. OAll is removed on the solid phase using $Pd(PPh_3)_4$ and NMM in DMF.

* Wang resin pre-loaded with Fmoc-His(Boc)-OH, a unique His building block which ensures high enantiomeric purity (≥ 99.5%) during the loading process.

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