



## High Quality Amino Acid Derivatives for SPPS (99.5% Purity)



### Vio Chemicals AG

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## Solid Phase Peptide Synthesis

During solid phase peptide synthesis (SPPS) with 9-fluorenylmethyloxycarbonyl (Fmoc), the free N-terminus of a peptide which is attached to a solid phase via a linker, forms an amide bond with the carboxy group of an amino acid whose amide group is protected by Fmoc (9-fluorenylmethyloxycarbonyl). After removal of the Fmoc protecting group the newly introduced amino acid provides the free N-terminus and the process can start over.

### VIO Chemicals' Products for SPPS

VIO Chemicals covers a portfolio of 16 Fmoc protected amino acids of 99.5% purity. A list of including specifications can be found below.

In addition to the Fmoc amino acids we provide *tert*-butyloxycarbonyl (Boc)- and Benzyloxy-carbonyl (Z)-protected amino acids as well as peptide fragments like Fmoc-pseudoprolines or Fmoc-, Boc- and Z-protected oligopeptides.

General Fmoc specifications are:

<b>Purity</b>	99.5% min.
<b>Specified impurities</b>	0.1% max
<b>Each unspecified impurity</b>	0.1% max
<b>Sum of unspecified impurities</b>	0.2% max

<b>Product</b>	<b>CAS Number</b>	<b>Page</b>
Fmoc-Ala-OH·H <sub>2</sub> O	CAS 207291-76-7	3
Fmoc-Asn(Trt)-OH	CAS 132388-59-1	4
Fmoc-Gln(Trt)-OH	CAS 132327-80-1	5
Fmoc-Glu(OtBu)-OH·H <sub>2</sub> O	CAS 204251-24-1	6
Fmoc-Gly-OH	CAS 29022-11-5	7
Fmoc-Ile-OH	CAS 71989-23-6	8
Fmoc-Leu-OH	CAS 35661-60-0	9
Fmoc-Lys(Boc)-OH	CAS 71989-26-9	10
Fmoc-Met-OH	CAS 71989-28-1	11
Fmoc-Phe-OH	CAS 35661-40-6	12
Fmoc-Pro-OH	CAS 71989-31-6	13
Fmoc-Ser(tBu)-OH	CAS 71989-33-8	14
Fmoc-Thr(tBu)-OH	CAS 71989-35-0	15
Fmoc-Trp(Boc)-OH	CAS 143824-78-6	16
Fmoc-Tyr(tBu)-OH	CAS 71989-38-3	17
Fmoc-Val-OH	CAS 68858-20-8	18

**Fmoc-Ala-OH·H<sub>2</sub>O****CAS 207291-76-7**

Molecular formula:

C<sub>18</sub>H<sub>17</sub>NO<sub>4</sub>·H<sub>2</sub>O

Molecular weight:

311.33

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

Fmoc-Val-OH

0.1% max

Fmoc-Ile-OH

0.1% max

Fmoc-Leu-OH

0.1% max

Fmoc-D - Ala-OH

0.1% max

Fmoc-β - Ala -OH

0.1% max

Fmoc-β -Ala- Ala-OH

0.1% max

Fmoc-OH

0.1% max

HOSU

0.1% max

Highest single impurity

0.1% max

Sum of unspecified impurities

0.2% max

Related substances(By TLC):

H- Ala -OH

0.1% max

H-D- Ala -OH

0.1% max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

6.0% max

Solubility

Clear solution obtained in 10%W/V in 10%  
DMF

**Fmoc-Asn(Trt)-OH****CAS 132388-59-1**

Molecular formula:

C<sub>38</sub>H<sub>32</sub>N<sub>2</sub>O<sub>5</sub>

Molecular weight:

596.67

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

H- Asn(Trt)-OH

0.1%max

Fmoc -ASN -OH

0.1%max

Fmoc -D-Asn(Trt) -OH

0.1%max

Fmoc- β - Ala -OH

0.1%max

Fmoc- β -Ala- Asn(Trt) -OH

0.1%max

Fmoc-OH

0.1%max

HOSU

0.1%max

Highest single impurity

0.1%max

Sum of unspecified impurities

0.2%max

Related substances(By TLC):

H- Asn-OH

0.1%max

H- D-Asn-OH

0.1%max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

1.0% max

Solubility

Clear solution obtained in 10%W/V in 10% DMF

**Fmoc-Gln(Trt)-OH****CAS 132327-80-1**

Molecular formula:

C<sub>39</sub>H<sub>34</sub>N<sub>2</sub>O<sub>5</sub>

Molecular weight:

610.70

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

H- Gln(Trt)-OH

0.1%max

Fmoc -GLN -OH

0.1%max

Fmoc -D-Gln(Trt) -OH

0.1%max

Fmoc- β - Ala -OH

0.1%max

Fmoc- β -Ala- Gln(Trt) -OH

0.1%max

Fmoc-OH

0.1%max

HOSU

0.1%max

Highest single impurity

0.1%max

Sum of unspecified impurities

0.2%max

Related substances(By TLC):

H- Gln-OH

0.1%max

H- D-Gln-OH

0.1%max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

2.0% max

Solubility

Clear solution obtained in 10%W/V in 10% DMF

**Fmoc-Glu(OtBu)-OH·H<sub>2</sub>O****CAS 204251-24-1**

Molecular formula:

C<sub>24</sub>H<sub>27</sub>NO<sub>6</sub>·H<sub>2</sub>O

Molecular weight:

443.49

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

Fmoc -Glu-OH

0.1%max

Fmoc -D-Gln(OtBu) -OH

0.1%max

Fmoc- β - Ala -OH

0.1%max

Fmoc- β -Ala- Gln(OtBu)-OH

0.1%max

Fmoc-OH

0.1%max

HOSU

0.1%max

Highest single impurity

0.1%max

Sum of unspecified impurities

0.2%max

Related substances(By TLC):

H- Gln-OH

0.1%max

H- D-Gln-OH

0.1%max

H- Glu(OtBu)-OH

0.1%max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

6.0% max

Solubility

Clear solution obtained in 10%W/V in 10% DMF

**Fmoc-Gly-OH****CAS 29022-11-5**

Molecular formula:

C<sub>17</sub>H<sub>15</sub>NO<sub>4</sub>

Molecular weight:

297.31

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

Fmoc - Val -OH

0.1% max

Fmoc -Ala -OH

0.1% max

Fmoc -Leu -OH

0.1% max

Fmoc -Gly-OH

0.1% max

Fmoc-  $\beta$  - Ala -OH

0.1% max

Fmoc-  $\beta$  -Ala- Gly -OH

0.1% max

Fmoc-OH

0.1% max

HOSU

0.1% max

Highest single impurity

0.1% max

Sum of unspecified impurities

0.2% max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

1.0% max

Solubility

Clear solution obtained in 10%W/V in 10% DMF

**Fmoc-Ile-OH****CAS 71989-23-6**

Molecular formula:

C<sub>21</sub>H<sub>23</sub>NO<sub>4</sub>

Molecular weight:

353.41

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

Fmoc -Val -OH

0.1% max

Fmoc -Ala -OH

0.1% max

Fmoc -Leu -OH

0.1% max

Fmoc -Gly -OH

0.1% max

Fmoc -D-Ile-OH

0.1% max

Fmoc-β -Ala -OH

0.1% max

Fmoc-β -Ala- Ile-OH

0.1% max

Fmoc-OH

0.1% max

HOSU

0.1% max

Highest single impurity

0.1% max

Sum of unspecified impurities

0.2% max

Related substances(By TLC):

H- Ile -OH

0.1% max

H-D- Ile -OH

0.1% max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

1.0% max

Solubility

Clear solution obtained in 10%W/V in 10%  
DMF



<b>Fmoc-Leu-OH</b>	<b>CAS 35661-60-0</b>
Molecular formula:	C <sub>21</sub> H <sub>23</sub> NO <sub>4</sub>
Molecular weight:	353.41
Appearance	White to off-white powder
Identity (IR)	Must conform with structure
Purity(HPLC)	99.5% min
Related substances(By HPLC):	
Fmoc -D -Leu -OH	0.1% max
Fmoc -Val -OH	0.1% max
Fmoc -Ala -OH	0.1% max
Fmoc -Ile -OH	0.1% max
Fmoc -Gly-OH	0.1% max
Fmoc- $\beta$ - Leu -OH	0.1% max
Fmoc- $\beta$ -Ala- Leu -OH	0.1% max
Fmoc-OH	0.1% max
HOSU	0.1% max
Highest single impurity	0.1% max
Sum of unspecified impurities	0.2% max
Related substances(By TLC):	
H-Leu-OH	0.1% max
H-D-Leu-OH	0.1% max
Assay by titrimetry(% w/w on anhydrous basis)	99.0% min
Water	1.0% max
Solubility	Clear solution obtained in 10%W/V in 10% DMF

**Fmoc-Lys(Boc)-OH****CAS 71989-26-9**

Molecular formula:

C<sub>26</sub>H<sub>32</sub>N<sub>2</sub>O<sub>6</sub>

Molecular weight:

468.54

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

H-Lys(Boc)-OH

0.1% max

Fmoc -Lys-OH

0.1% max

Fmoc -D -Lys(Boc) -OH

0.1% max

Fmoc -Lys(Fmoc) -OH

0.1% max

Fmoc-  $\beta$  - Ala -OH

0.1% max

Fmoc-  $\beta$  -Ala- Lys(Boc)-OH

0.1% max

Fmoc-OH

0.1% max

HOSU

0.1% max

Highest single impurity

0.1% max

Sum of unspecified impurities

0.2% max

Related substances(By TLC):

H-Lys-OH

0.1% max

H-D-Lys-OH

0.1% max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

1.0% max

Solubility

Clear solution obtained in 10%W/V in 10% DMF

<b>Fmoc-Met-OH</b>	<b>CAS 71989-28-1</b>
Molecular formula:	C <sub>20</sub> H <sub>21</sub> NO <sub>4</sub> S
Molecular weight:	337.37
Appearance	White to off white powder
Identity (IR)	Must be conform with structure
Assay	99.0% min
Water content (K. F.)	1.0% max
Residual solvents (GC)	informative
HPLC purity	99.5% max
Specific impurities:	
H-Met-OH	0.1% max
H-D-Met-OH	0.1% max
Fmoc-D-Met-OH	0.1% max
Fmoc-β-Ala-OH	0.1% max
Fmoc-β-Ala-Met-OH	0.1% max
Each unspecified impurity	0.1% max
Sum of unspecified impurities	0.2% max
Solubility	Clear solution obtained in 10%W/V in 10% DMF

<b>Fmoc-Phe-OH</b>	<b>CAS 35661-40-6</b>
Molecular formula:	C <sub>24</sub> H <sub>21</sub> NO <sub>4</sub>
Molecular weight:	387.43
Appearance	White to off-white powder
Identity (IR)	Must conform with structure
Purity(HPLC)	99.5% min
Related substances(By HPLC):	
H- Phe -OH	0.1% max
H-D- Phe -OH	0.1% max
Fmoc -D - Phe -OH	0.1% max
Fmoc- β - Ala -OH	0.1% max
Fmoc- β -Ala- Phe -OH	0.1% max
Fmoc-OH	0.1% max
HOSU	0.1% max
Highest single impurity	0.1% max
Sum of unspecified impurities	0.2% max
Assay by titrimetry(% w/w on anhydrous basis)	99.0% min
Water	2.0% max
Solubility	Clear solution obtained in 10%W/V in 10% DMF

**Fmoc-Pro-OH****CAS 71989-31-6**

Molecular formula:	C <sub>20</sub> H <sub>19</sub> NO <sub>4</sub>
Molecular weight:	337.37
Appearance	White to off-white powder
Identity (IR)	Must conform with structure
Purity(HPLC)	99.5% min
Related substances(By HPLC):	
Fmoc -D - Pro -OH	0.1% max
Fmoc-β - Ala -OH	0.1% max
Fmoc-β -Ala- Pro -OH	0.1% max
Fmoc-OH	0.1% max
HOSU	0.1% max
Highest single impurity	0.1% max
Sum of unspecified impurities	0.2% max
Related substances(By TLC):	
H- Pro -OH	0.1% max
H-D- Pro -OH	0.1% max
Assay by titrimetry(% w/w on anhydrous basis)	99.0% min
Water	1.0% max
Solubility	Clear solution obtained in 10%W/V in 10% DMF

<b>Fmoc-Ser(tBu)-OH</b>	<b>CAS 71989-33-8</b>
Molecular formula:	C <sub>22</sub> H <sub>25</sub> NO <sub>5</sub>
Molecular weight:	383.44
Appearance	White to off-white powder
Identity (IR)	Must conform with structure
Purity(HPLC)	99.5% min
Related substances(By HPLC):	
Fmoc -Ser-OH	0.1% max
Fmoc -D -Ser(tBu) -OH	0.1% max
Fmoc- β -Ala -OH	0.1% max
Fmoc- β -Ala- Ser(tBu)-OH	0.1% max
Fmoc-OH	0.1% max
HOSU	0.1% max
Highest single impurity	0.1% max
Sum of unspecified impurities	0.2% max
Related substances(By TLC):	
H-Ser-OH	0.1% max
H-D-Ser-OH	0.1% max
H-Ser(tBu)-OH	0.1% max
Assay by titrimetry(% w/w on anhydrous basis)	99.0% min
Water	1.0% max
Solubility	Clear solution obtained in 10%W/V in 10% DMF

<b>Fmoc-Thr(tBu)-OH</b>	<b>CAS 71989-35-0</b>
Molecular formula:	C <sub>23</sub> H <sub>27</sub> NO <sub>5</sub>
Molecular weight:	397.46
Appearance	White to off white powder
Identity (IR)	Must be conform with structure
Assay	99.0% min
Water content (K. F.)	1.0% max
Residual solvents (GC)	informative
HPLC purity	99.5% min
Specific impurities:	
H-Thr-OH	0.1% max
H-D-Thr-OH	0.1% max
H-Thr(tBu)-OH	0.1% max
H-allo-Thr-OH	0.1% max
H-D-allo-Thr-OH	0.1% max
Fmoc-Thr-OH	0.1% max
Fmoc-D-Thr(tBu)-OH	0.1% max
Fmoc-allo-Thr-OH	0.1% max
Fmoc-D-allo-Thr-OH	0.1% max
Fmoc-β-Ala-OH	0.1% max
Fmoc-β-Ala-Thr(tBu)-OH	0.1% max
HOSU	0.1% max
Each unspecified impurity	0.1% max
Sum of unspecified impurities	0.2% max
Solubility	Clear solution obtained in 10%W/V in 10% DMF

**Fmoc-Trp(Boc)-OH****CAS 143824-78-6**

Molecular formula:

C<sub>31</sub>H<sub>30</sub>N<sub>2</sub>O<sub>6</sub>

Molecular weight:

526.58

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

H-Trp-OH

0.1% max

H-D-Trp-OH

0.1% max

H-Trp(Boc)-OH

0.1% max

Fmoc -Trp-OH

0.1% max

Fmoc -D -Trp(Boc) -OH

0.1% max

Fmoc -Trp(Fmoc)-OH

0.1% max

Fmoc- β -Ala -OH

0.1% max

Fmoc- β -Ala- Trp(Boc) -OH

0.1% max

Fmoc-OH

0.1% max

HOSU

0.1% max

Highest single impurity

0.1% max

Sum of unspecified impurities

0.2% max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

1.0% max

Solubility

Clear solution obtained in 10%W/V in 10%  
DMF



**Fmoc-Tyr(tBu)-OH****CAS 71989-38-3**

Molecular formula:

C<sub>28</sub>H<sub>29</sub>NO<sub>5</sub>

Molecular weight:

459.53

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

H-Tyr-OH

0.1% max

H-D-Tyr-OH

0.1% max

H-Tyr(tBu)-OH

0.1% max

Fmoc -Tyr-OH

0.1% max

Fmoc -D -Tyr(tBu) -OH

0.1% max

Fmoc-β -Ala -OH

0.1% max

Fmoc-β -Ala- Tyr(tBu)-OH

0.1% max

Fmoc-OH

0.1% max

HOSU

0.1% max

Highest single impurity

0.1% max

Sum of unspecified impurities

0.2% max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

1.0% max

Solubility

Clear solution obtained in 10%W/V in 10% DMF

**Fmoc-Val-OH****CAS 68858-20-8**

Molecular formula:

C<sub>20</sub>H<sub>21</sub>NO<sub>4</sub>

Molecular weight:

339.39

Appearance

White to off-white powder

Identity (IR)

Must conform with structure

Purity(HPLC)

99.5% min

Related substances(By HPLC):

Fmoc -D- Val -OH

0.1% max

Fmoc -Leu -OH

0.1% max

Fmoc -Ala -OH

0.1% max

Fmoc- Ile-OH

0.1%max

Fmoc -Gly-OH

0.1% max

Fmoc-  $\beta$  - Val -OH

0.1% max

Fmoc-  $\beta$  -Ala- Val -OH

0.1% max

Fmoc-OH

0.1% max

HOSU

0.1% max

Highest single impurity

0.1% max

Sum of unspecified impurities

0.2% max

Related substances(By TLC):

H-Val-OH

0.1% max

H-D-Val-OH

0.1% max

Assay by titrimetry(% w/w on anhydrous basis)

99.0% min

Water

1.0% max

Solubility

Clear solution obtained in 10%W/V in 10%  
DMF