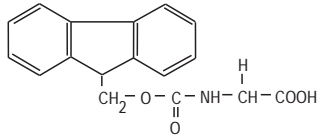
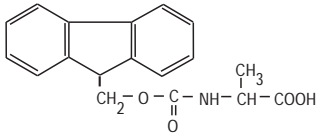
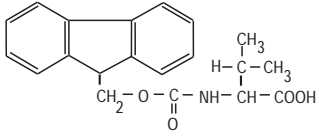
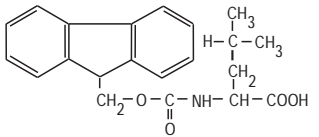
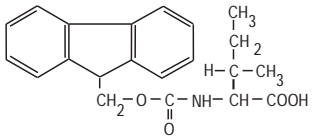
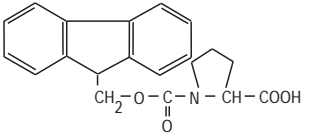

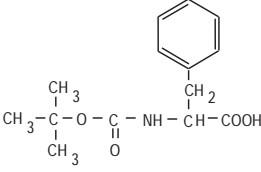
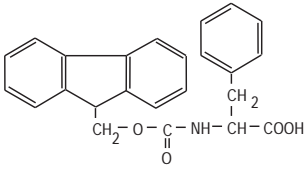
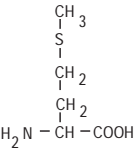
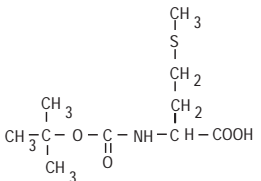
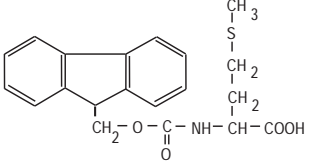
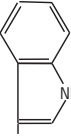
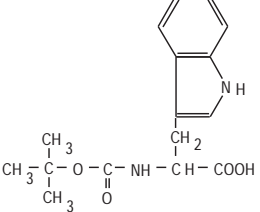
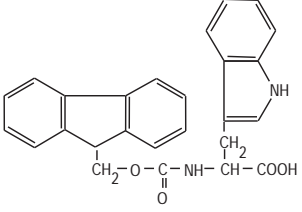
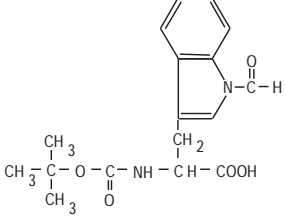
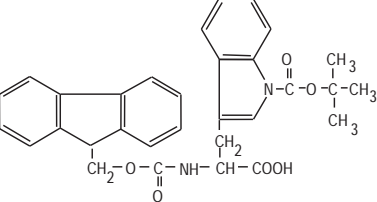
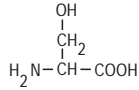
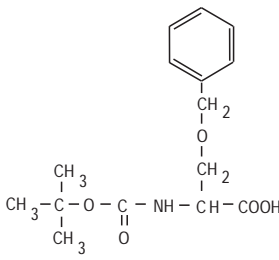
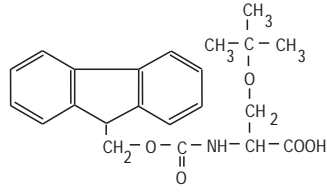
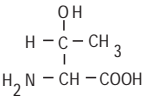
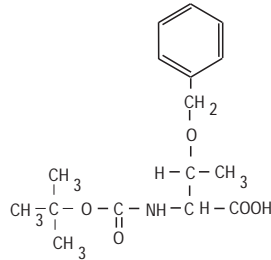
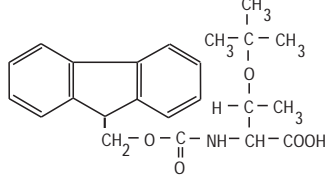
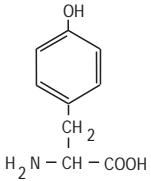
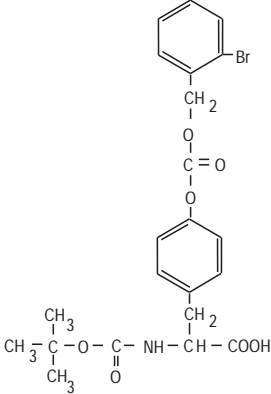
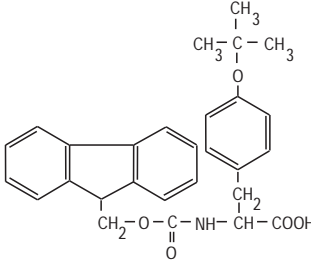


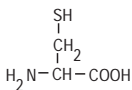
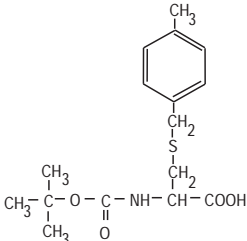
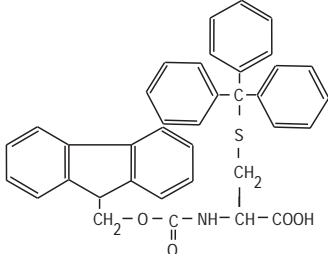
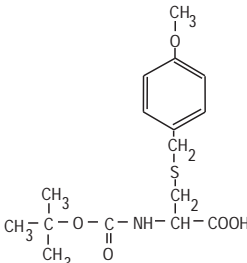
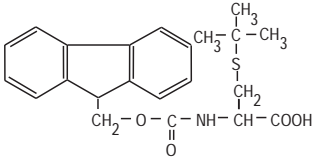
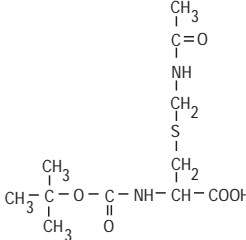
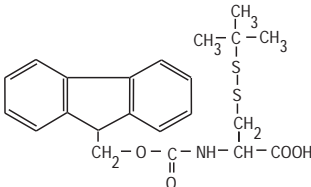
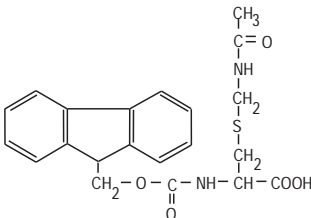
Molecular Weights and Residue Weights of Protected Amino Acids

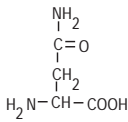
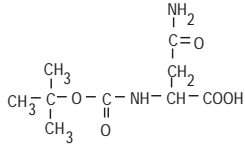
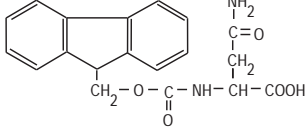
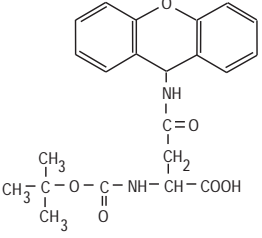
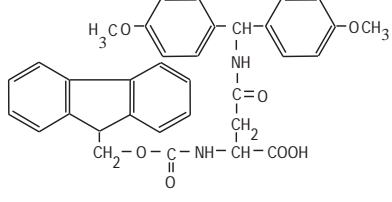
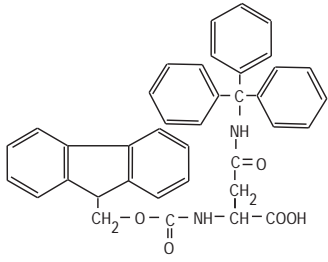
Amino Acid	Boc Derivative	M.W.	Residue Wt. in Protected Peptide Chain	Fmoc Derivative	M.W.	Residue Wt. in Protected Peptide Chain
Alanine	Boc-Ala	189	71	Fmoc-Ala	311	71
Arginine	Boc-Arg(Tos)	429	311	Fmoc-Arg(Mtr)	609	369
	Boc-Arg(Mts)	457	339	Fmoc-Arg(Pmc)	663	423
Asparagine	Boc-Asn	232	114	Fmoc-Asn	354	11
				Fmoc-Asn(Mbh)	581	341
				Fmoc-Asn(Trt)	597	357
Aspartic Acid	Boc-Asp(OBzl)	323	205	Fmoc-Asp(OtBu)	411	171
	Boc-Asp(OcHex)	315	197			
Cysteine	Boc-Cys(4-CH ₃ Bzl)	325	207	Fmoc-Cys(tBu)	400	160
	Boc-Cys(4-CH ₃ OBzl)	341	223	Fmoc-Cys(Trt)	586	346
	Boc-Cys(Acm)	292	174	Fmoc-Cys(Acm)	414	174
Glutamic Acid	Boc-Glu(OBzl)	337	219	Fmoc-Glu(OtBu)	425	185
	Boc-Glu(OcHex)	329	211			
Glutamine	Boc-Gln	246	128	Fmoc-Gln	368	128
				Fmoc-Gln(Mbh)	595	355
				Fmoc-Gln(Trt)	611	371
Glycine	Boc-Gly	175	57	Fmoc-Gly	297	57
Histidine	Boc-His(Dnp)	421	303	Fmoc-His(Trt)	620	380
	Boc-His(Bom)	375	257	Fmoc-His(Bum)	464	224
Isoleucine	Boc-Ile	231	113	Fmoc-Ile	353	113
Leucine	Boc-Leu	231	113	Fmoc-Leu	353	113
Lysine	Boc-Lys(Cl-Z)	415	297	Fmoc-Lys(Boc)	469	229
Methionine	Boc-Met	249	131	Fmoc-Met	371	131
	Boc-Met(O)	265	147			
Phenylalanine	Boc-Phe	265	147	Fmoc-Phe	387	147
Proline	Boc-Pro	215	97	Fmoc-Pro	337	97
Serine	Boc-Ser(Bzl)	295	177	Fmoc-Ser(tBu)	383	147
Threonine	Boc-Thr(Bzl)	309	191	Fmoc-Thr(tBu)	397	157
Tryptophan	Boc-Trp	304	186	Fmoc-Trp	426	186
	Boc-Trp(CHO)	332	214			
Tyrosine	Boc-Tyr(Br-Z)	494	376	Fmoc-Tyr(tBu)	460	220
Valine	Boc-Val	217	99	Fmoc-Val	339	99

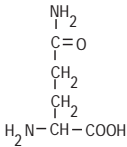
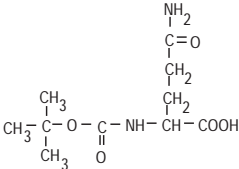
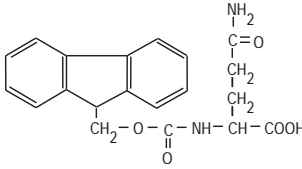
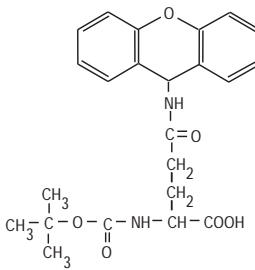
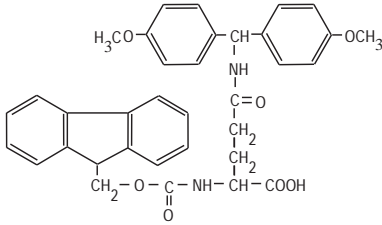
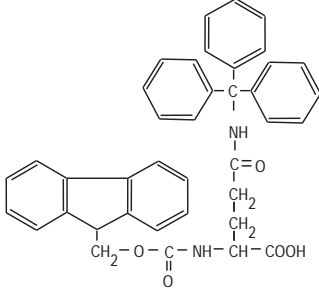
AMINO ACID	BOC PROTECTED DERIVATIVE	Fmoc PROTECTED DERIVATIVE
<p>G</p> $\begin{array}{c} \text{H} \\ \\ \text{H}_2\text{N}-\text{CH}-\text{COOH} \end{array}$ <p>Gly glycine MW 75.07</p>	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3-\text{C}-\text{O}-\text{C}(=\text{O})-\text{NH}-\text{CH}-\text{COOH} \\ \\ \text{CH}_3 \end{array}$ <p>Boc-Gly-OH N-Boc-glycine MW 175.18</p>	 <p>Fmoc-Gly-OH N-Fmoc-glycine MW 297.31</p>
<p>A</p> $\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_2\text{N}-\text{CH}-\text{COOH} \end{array}$ <p>Ala alanine MW 89.09</p>	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3-\text{C}-\text{O}-\text{C}(=\text{O})-\text{NH}-\text{CH}(\text{CH}_3)-\text{COOH} \\ \\ \text{CH}_3 \end{array}$ <p>Boc-Ala-OH N-Boc-L-alanine MW 189.21</p>	 <p>Fmoc-Ala-OH N-Fmoc-L-alanine MW 311.34</p>
<p>V</p> $\begin{array}{c} \text{CH}_3 \\ \\ \text{H}-\text{C}-\text{CH}_3 \\ \\ \text{H}_2\text{N}-\text{CH}-\text{COOH} \end{array}$ <p>Val valine MW 117.15</p>	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3-\text{C}-\text{O}-\text{C}(=\text{O})-\text{NH}-\text{CH}(\text{CH}(\text{CH}_3)_2)-\text{COOH} \\ \\ \text{CH}_3 \end{array}$ <p>Boc-Val-OH N-Boc-L-valine MW 217.27</p>	 <p>Fmoc-Val-OH N-Fmoc-L-valine MW 339.39</p>
<p>L</p> $\begin{array}{c} \text{CH}_3 \\ \\ \text{H}-\text{C}-\text{CH}_3 \\ \\ \text{CH}_2 \\ \\ \text{H}_2\text{N}-\text{CH}-\text{COOH} \end{array}$ <p>Leu leucine MW 131.18</p>	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}-\text{C}-\text{CH}_3 \\ \\ \text{CH}_2 \\ \\ \text{CH}_3-\text{C}-\text{O}-\text{C}(=\text{O})-\text{NH}-\text{CH}-\text{COOH} \\ \\ \text{CH}_3 \end{array}$ <p>Boc-Leu-OH N-Boc-L-leucine MW 231.29 MW 249.31 (H₂O)</p>	 <p>Fmoc-Leu-OH N-Fmoc-L-leucine MW 353.42</p>
<p>I</p> $\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_2 \\ \\ \text{H}-\text{C}-\text{CH}_3 \\ \\ \text{H}_2\text{N}-\text{CH}-\text{COOH} \end{array}$ <p>Ile isoleucine MW 131.18</p>	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_2 \\ \\ \text{H}-\text{C}-\text{CH}_3 \\ \\ \text{CH}_3-\text{C}-\text{O}-\text{C}(=\text{O})-\text{NH}-\text{CH}-\text{COOH} \\ \\ \text{CH}_3 \end{array}$ <p>Boc-Ile-OH N-Boc-L-isoleucine MW 231.29 MW 240.30 (1/2 H₂O)</p>	 <p>Fmoc-Ile-OH N-Fmoc-L-isoleucine MW 353.42</p>
<p>P</p> $\begin{array}{c} \text{CH}_2 \\ / \quad \backslash \\ \text{H}-\text{N}-\text{CH}-\text{COOH} \end{array}$ <p>Pro proline MW 115.13</p>	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3-\text{C}-\text{O}-\text{C}(=\text{O})-\text{N}-\text{CH}-\text{COOH} \\ \\ \text{CH}_3 \end{array}$ <p>Boc-Pro-OH N-Boc-L-proline MW 215.25</p>	 <p>Fmoc-Pro-OH N-Fmoc-L-proline MW 337.38</p>

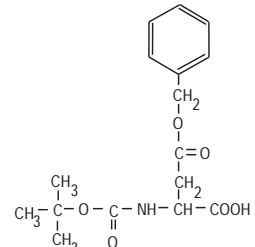
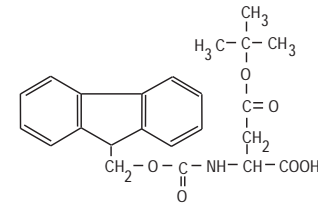
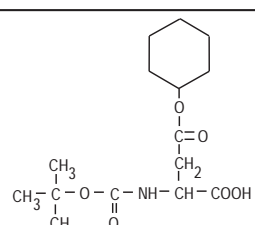
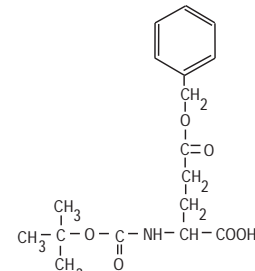
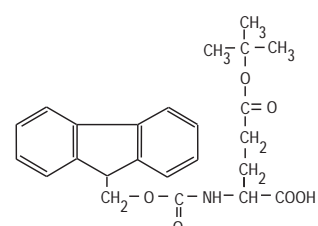
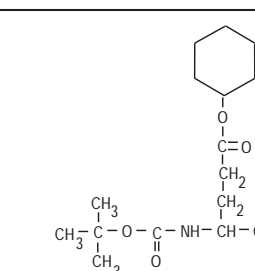
AMINO ACID	BOC PROTECTED DERIVATIVE	FMOC PROTECTED DERIVATIVE
<p>F</p>  <p>$\text{H}_2\text{N}-\text{CH}-\text{COOH}$</p> <p>Phe phenylalanine MW 165.19</p>	 <p>Boc-Phe-OH N-Boc-L-phenylalanine MW 265.31</p>	 <p>Fmoc-Phe-OH N-Fmoc-L-phenylalanine MW 387.44</p>
<p>M</p>  <p>$\text{H}_2\text{N}-\text{CH}-\text{COOH}$</p> <p>Met methionine MW 149.21</p>	 <p>Boc-Met-OH N-Boc-L-methionine MW 249.33</p>	 <p>Fmoc-Met-OH N-Fmoc-L-methionine MW 371.46</p>
<p>W</p>  <p>$\text{H}_2\text{N}-\text{CH}-\text{COOH}$</p> <p>Trp tryptophan MW 204.23</p>	 <p>Boc-Trp-OH N-Boc-L-tryptophan MW 304.35</p>	 <p>Fmoc-Trp-OH N-Fmoc-L-tryptophan MW 426.47</p>
	 <p>Boc-Trp(CHO)-OH N-α-Boc-N-indole-formyl-L-tryptophan MW 332.36</p>	 <p>Fmoc-Trp(Boc)-OH N-Fmoc-N-indole-Boc-L-tryptophan MW 526.59</p>

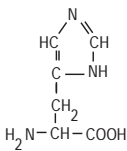
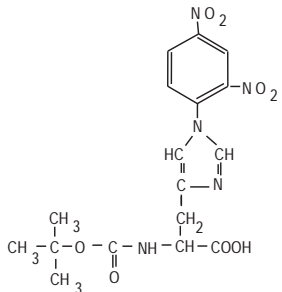
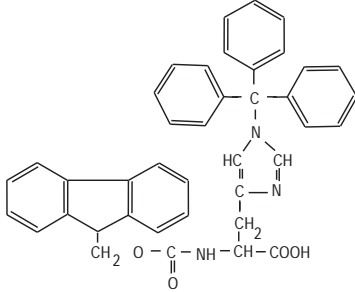
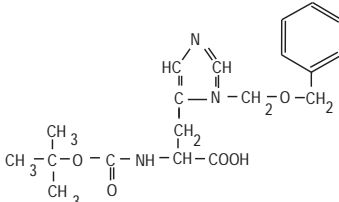
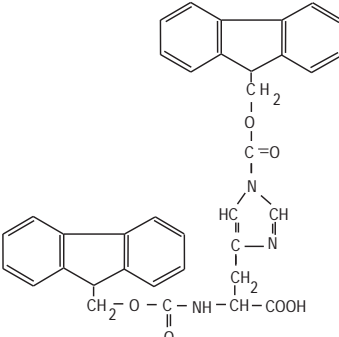
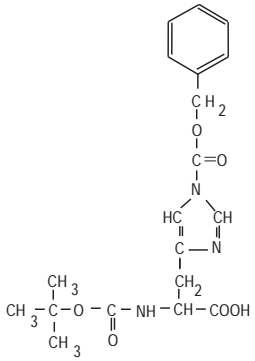
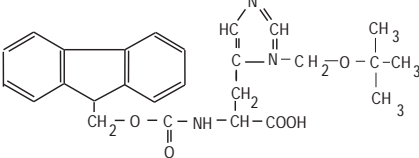
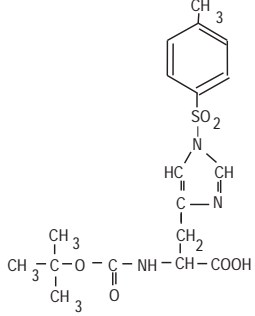
AMINO ACID	BOC PROTECTED DERIVATIVE	FMOC PROTECTED DERIVATIVE
<p>S</p>  <p>Ser serine MW 105.09</p>	 <p>Boc-Ser(Bzl)-OH N-Boc-O-benzyl-L-serine MW 295.34</p>	 <p>Fmoc-Ser(tBu)-OH N-Fmoc-O-t-butyl-L-serine MW 383.44</p>
<p>T</p>  <p>Thr threonine MW 119.12</p>	 <p>Boc-Thr(Bzl)-OH N-Boc-O-benzyl-L-threonine MW 309.36</p>	 <p>Fmoc-Thr(tBu)-OH N-Fmoc-O-t-butyl-L-threonine MW 397.47</p>
<p>Y</p>  <p>Tyr tyrosine MW 181.19</p>	 <p>Boc-Tyr(Br-Z)-OH N-Boc-O-(2-bromobenzyloxycarbonyl)-L-tyrosine MW 494.35</p>	 <p>Fmoc-Tyr(tBu)-OH N-Fmoc-O-t-butyl-L-tyrosine MW 459.54</p>

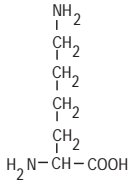
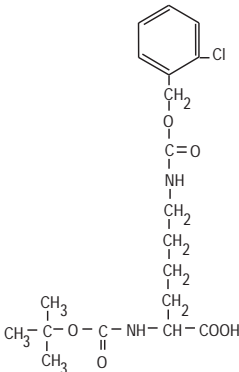
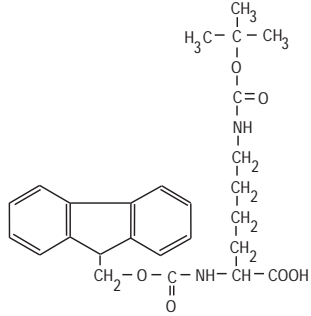
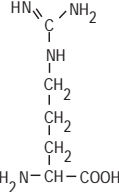
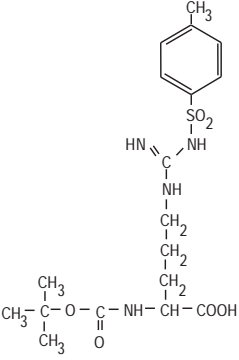
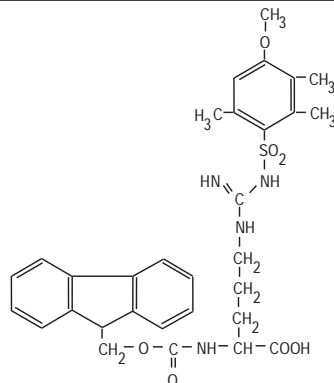
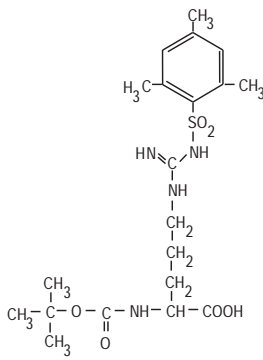
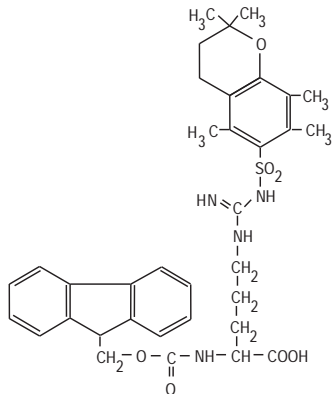
AMINO ACID	BOC PROTECTED DERIVATIVE	FMOC PROTECTED DERIVATIVE
<p>C</p>  <p>Cys cysteine MW 121.16</p>	 <p>Boc-Cys(4-CH₃Bzl)-OH Boc-Cys(MeBzl)-OH N-Boc-S-4-methylbenzyl-L-cysteine MW 325.43</p>	 <p>Fmoc-Cys(Trt)-OH N-Fmoc-S-trityl-L-cysteine MW 585.72</p>
	 <p>Boc-Cys(4-CH₃OBzl)-OH Boc-Cys(Mob)-OH Boc-Cys(Mbzl)-OH N-Boc-S-p-methoxybenzyl-L-cysteine MW 341.43</p>	 <p>Fmoc-Cys(tBu)-OH N-Fmoc-S-t-butyl-L-cysteine MW 399.51</p>
	 <p>Boc-Cys(Acm)-OH N-Boc-S-acetamidomethyl-L-cysteine MW 292.35</p>	 <p>Fmoc-Cys(S-tBu)-OH N-Fmoc-S-t-butylsulfenyl-L-cysteine MW 431.57</p>
		 <p>Fmoc-Cys(Acm)-OH N-Fmoc-S-acetamidomethyl-L-cysteine MW 414.48</p>

AMINO ACID	BOC PROTECTED DERIVATIVE	FMOC PROTECTED DERIVATIVE
<p>N</p>  <p>Asn asparagine MW 132.12</p>	 <p>Boc-Asn-OH N-α-Boc-L-asparagine MW 232.24</p>	 <p>Fmoc-Asn-OH N-α-Fmoc-L-asparagine MW 354.36</p>
	 <p>Boc-Asn(Xan)-OH N-α-Boc-N-β-xanthyl-L-asparagine MW 412.44</p>	 <p>Fmoc-Asn(Mbh)-OH N-α-Fmoc-N-β-(dimethoxybenzhydryl)-L-asparagine MW 580.64</p> <p>Mbh also known as: Dod = dimethoxydityl Ddm = dimethoxydiphenylmethyl</p>
		 <p>Fmoc-Asn(Trt)-OH N-α-Fmoc-N-β-(trityl)-L-asparagine MW 596.69</p>

AMINO ACID	BOC PROTECTED DERIVATIVE	FMOC PROTECTED DERIVATIVE
<p>Q</p>  <p>Gln glutamine MW 146.15</p>	 <p>Boc-Gln-OH N-α-Boc-L-glutamine MW 246.26</p>	 <p>Fmoc-Gln-OH N-α-Fmoc-L-glutamine MW 368.39</p>
	 <p>Boc-Gln(Xan)-OH N-α-Boc-N-γ-xanthy-L-glutamine MW 426.47</p>	 <p>Fmoc-Gln(Mbh)-OH N-α-Fmoc-N-γ-(dimethoxybenzhydryl)-L-glutamine MW 594.66</p> <p>Mbh also known as: Dod = dimethoxydityl Ddm = Dimethoxydiphenylmethyl</p>
		 <p>Fmoc-Gln(Trt)-OH N-α-Fmoc-N-γ-(trityl)-L-glutamine MW 610.72</p>

AMINO ACID	BOC PROTECTED DERIVATIVE	FMOC PROTECTED DERIVATIVE
<p>D</p> $ \begin{array}{c} \text{OH} \\ \\ \text{C}=\text{O} \\ \\ \text{CH}_2 \\ \\ \text{H}_2\text{N}-\text{CH}-\text{COOH} \end{array} $ <p>Asp aspartic acid MW 133.10</p>	 <p>Boc-Asp(OBzl)-OH N-Boc-L-aspartic acid-β-benzyl ester MW 323.35</p>	 <p>Fmoc-Asp(OtBu)-OH N-Fmoc-L-aspartic acid-β-t-butyl ester MW 411.45</p>
	 <p>Boc-Asp(OcHex)-OH N-Boc-L-aspartic acid-β-cyclohexyl ester MW 315.37</p>	
<p>E</p> $ \begin{array}{c} \text{OH} \\ \\ \text{C}=\text{O} \\ \\ \text{CH}_2 \\ \\ \text{CH}_2 \\ \\ \text{H}_2\text{N}-\text{CH}-\text{COOH} \end{array} $ <p>Glu glutamic acid MW 147.13</p>	 <p>Boc-Glu(OBzl)-OH N-Boc-L-glutamic acid-γ-benzyl ester MW 337.37</p>	 <p>Fmoc-Glu(OtBu)-OH N-Fmoc-L-glutamic acid-γ-t-butyl ester MW 425.49</p>
	 <p>Boc-Glu(OcHex)-OH N-Boc-L-glutamic acid-γ-cyclohexyl ester MW 329.39</p>	

AMINO ACID	BOC PROTECTED DERIVATIVE	FMOC PROTECTED DERIVATIVE
<p>H</p>  <p>His histidine MW 155.16</p>	 <p>Boc-His(Dnp)-OH N-α-Boc-N-im-dinitrophenyl-L-histidine MW 421.38</p>	 <p>Fmoc-His(Trt)-OH N-α-Fmoc-N-im-dinitrophenyl-L-histidine MW 619.72</p>
	 <p>Boc-His(πBom)-OH N-α-Boc-N-π-benzyloxymethyl-L-histidine MW 375.43</p>	 <p>Fmoc-His(Fmoc)-OH N-α-N-im-Bis-Fmoc-L-histidine MW 599.64</p>
	 <p>Boc-His(Z)-OH N-α-Boc-N-im-benzyloxycarbonyl-L-histidine MW 389.41</p>	 <p>Fmoc-His(πBum)-OH N-α-Fmoc-N-π-butyloxymethyl-L-histidine MW 463.54</p>
	 <p>Boc-His(Tos)-OH N-α-Boc-N-im-tosyl-L-histidine MW 409.46 MW 590.78 (DCHA)</p>	

AMINO ACID	BOC PROTECTED DERIVATIVE	FMOC PROTECTED DERIVATIVE
<p>K</p>  <p>Lys lysine MW 146.19</p>	 <p>Boc-Lys(Cl-Z)-OH N-α-Boc-N-ϵ-(2-chlorobenzoyloxycarbonyl)-L-lysine MW 414.89</p>	 <p>Fmoc-Lys(Boc)-OH N-α-Fmoc-N-ϵ-Boc-L-lysine MW 468.55</p>
<p>R</p>  <p>Arg arginine MW 174.20</p>	 <p>Boc-Arg(Tos)-OH N-α-Boc-N^G-tosyl-L-arginine MW 428.51</p>	 <p>Fmoc-Arg(Mtr)-OH N-α-Fmoc-N^G-(4-methoxy-2,3,6-trimethylbenzenesulfonyl)-L-arginine MW 668.8 (IPE)</p>
	 <p>Boc-Arg(Mts)-OH N-α-Boc-N^G-(mesitylene-2-sulfonyl)-L-arginine MW 456.56</p>	 <p>Fmoc-Arg(Pmc)-OH N-α-Fmoc-N^G-(2,2,5,7,8-pentamethylchroman-6-sulfonyl)-L-arginine MW 662.81</p>