

H
155.16
137.14
C₆H₉N₃O₂

His

Histidine

Periodic Chart of Amino Acids

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D
133.10
115.09
C₄H₇NO₄

Asp

Aspartic Acid

R
174.20
156.19
C₆H₁₄N₄O₂

Arg

Arginine

F
165.19
147.18
C₉H₁₁NO₂

Phe

Phenylalanine

A
89.09
71.08
C₃H₇NO₂

Ala

Alanine

C
121.16
103.14
C₃H₇NO₂S

Cys

Cysteine

G
75.07
57.05
C₂H₅NO₂

Gly

Glycine

Q
146.15
128.13
C₃H₁₀N₂O₃

Gln

Glutamine

E
147.13
129.11
C₅H₉NO₄

Glu

Glutamic Acid

K
146.19
128.17
C₆H₁₄N₂O₂

Lys

Lysine

L
131.18
113.16
C₆H₁₃NO₂

Leu

Leucine

M
149.21
131.20
C₅H₁₁NO₂S

Met

Methionine

N
132.12
114.10
C₄H₈N₂O₃

Asn

Asparagine

S
105.09
87.08
C₃H₇NO₃

Ser

Serine

Y
181.19
163.17
C₉H₁₁NO₃

Tyr

Tyrosine

T
119.12
101.10
C₄H₉NO₃

Thr

Threonine

I
131.18
113.16
C₆H₁₃NO₂

Ile

Isoleucine

W
204.23
186.21
C₁₁H₁₂N₂O₂

Trp

Tryptophan

P
115.13
97.12
C₅H₉NO₂

Pro

Proline

V
117.15
99.13
C₅H₁₁NO₂

Val

Valine

- Basic
- Non-polar (hydrophobic)
- Polar, uncharged
- Acidic

1-Letter Amino Acid Code: **S**

3-Letter Amino Acid Code: **Ser**

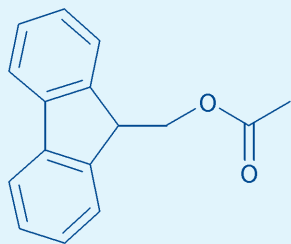
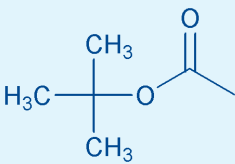
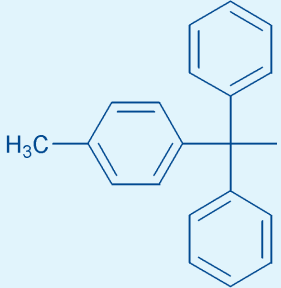
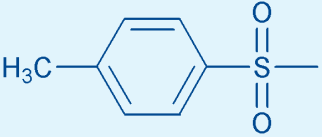
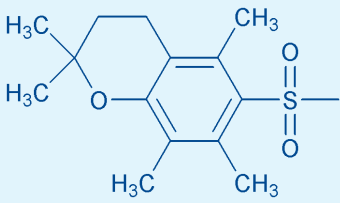
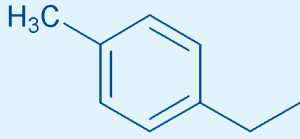
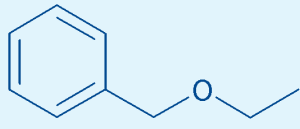
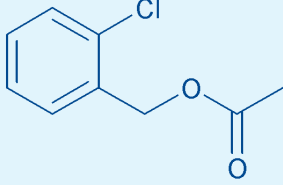
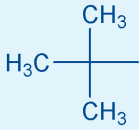
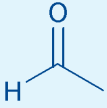
Relative Molecular Mass: 105.09

M_r - H₂O: 87.08

Molecular Formula: C₃H₇NO₃

Chemical Structure

Chemical Name: **Serine**

Common Fmoc-Strategy SPPS* Protecting Groups	Absorption and Emission Characteristics of Chromophores and Fluorophores	Common Boc-Strategy SPPS* Protecting Groups																																							
Fmoc 9-Fluorenylmethoxy-carbonyl M_r = 223.25 	<table><tr><th>Fluorophore</th><th>Excitation Wavelength</th><th>Emission Wavelength</th></tr><tr><td>Abz (2-Aminobenzoyl or Anthraniloyl)</td><td>320 nm</td><td>420 nm</td></tr><tr><td>N-Me-Abz (N-Methyl-anthraniloyl)</td><td>340 - 360 nm</td><td>440 - 450 nm</td></tr><tr><td>AFC (7-Amido-4-trifluoromethylcoumarin)</td><td>395 - 400 nm</td><td>495 - 505 nm</td></tr><tr><td>AMC (7-Amido-4-methylcoumarin)</td><td>360 - 380 nm</td><td>440 - 460 nm</td></tr><tr><td>Dansyl (5-(Dimethylamino)naphthalene-1-sulfonyl)</td><td>342 nm</td><td>562 nm</td></tr><tr><td>EDANS (5-[(2-Aminoethyl)amino] naphthalene-1-sulfonic acid)</td><td>340 nm</td><td>490 nm</td></tr><tr><td>FITC (Fluorescein isothiocyanate)</td><td>490 nm</td><td>520 nm</td></tr><tr><td>Mca ((7-Methoxycoumarin-4-yl)acetyl)</td><td>325 nm</td><td>392 nm</td></tr><tr><td>4MbNA (4-Methoxy-β-naphthylamide)</td><td>335 - 350 nm</td><td>410 - 440 nm</td></tr><tr><td>βNA (β-Naphthylamide)</td><td>320 - 340 nm</td><td>410 - 420 nm</td></tr><tr><td>Trp (Tryptophan)</td><td>280 nm</td><td>360 nm</td></tr><tr><td></td><td></td><td></td></tr></table>	Fluorophore	Excitation Wavelength	Emission Wavelength	Abz (2-Aminobenzoyl or Anthraniloyl)	320 nm	420 nm	N-Me-Abz (N-Methyl-anthraniloyl)	340 - 360 nm	440 - 450 nm	AFC (7-Amido-4-trifluoromethylcoumarin)	395 - 400 nm	495 - 505 nm	AMC (7-Amido-4-methylcoumarin)	360 - 380 nm	440 - 460 nm	Dansyl (5-(Dimethylamino)naphthalene-1-sulfonyl)	342 nm	562 nm	EDANS (5-[(2-Aminoethyl)amino] naphthalene-1-sulfonic acid)	340 nm	490 nm	FITC (Fluorescein isothiocyanate)	490 nm	520 nm	Mca ((7-Methoxycoumarin-4-yl)acetyl)	325 nm	392 nm	4MbNA (4-Methoxy-β-naphthylamide)	335 - 350 nm	410 - 440 nm	βNA (β-Naphthylamide)	320 - 340 nm	410 - 420 nm	Trp (Tryptophan)	280 nm	360 nm				Boc t-Butyloxycarbonyl M_r = 101.13 
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Mtt 4-Methyltrityl M_r = 257.36 		Tos Tosyl M_r = 155.20 																																							
Pmc 2,2,5,7,8-Pentamethyl-chroman-6-sulfonyl M_r = 267.37  EP 0 293 073 B1 US Patent 4,946,971 owned by Bachem		MbzI 4-Methylbenzyl M_r = 105.16 																																							
		Bom Benzyloxymethyl M_r = 121.16 																																							
		2-Chloro-Z 2-Chlorobenzyloxy-carbonyl M_r = 169.59 																																							
tBu t-Butyl M_r = 57.12 	<table><tr><th>Chromophore</th><th>Extinction Wavelength</th><th>Molar Extinction Coefficient</th></tr><tr><td>pNA (p-Nitroanilide)</td><td>405 nm 410 nm</td><td>ε_{405 nm} = 9450 M⁻¹cm⁻¹ ε_{410 nm} = 8800 M⁻¹cm⁻¹</td></tr></table> Values listed are as reported in the literature *SPPS = Solid Phase Peptide Synthesis © Copyright by Bachem AG, Switzerland. Reproduction forbidden without permission.	Chromophore	Extinction Wavelength	Molar Extinction Coefficient	pNA (p-Nitroanilide)	405 nm 410 nm	ε _{405 nm} = 9450 M ⁻¹ cm ⁻¹ ε _{410 nm} = 8800 M ⁻¹ cm ⁻¹	For Formyl M_r = 29.02 																																	
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