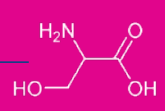
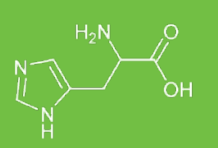
PERIODIC CHART OF AMINO ACIDS

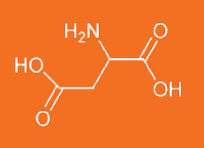
APIs ■ PEPTIDES ■ BUILDING BLOCKS ■ BIOCHEMICALS ■ CUSTOM SYNTHESIS ■ OLIGONUCLEOTIDES

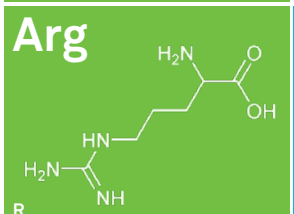
3-Letter Amino Acid Code — Chemical Structure — 1-Letter Amino Acid Code — Relative Molecular Mass — M_r-H_2O — Molecular Formula — Chemical Name

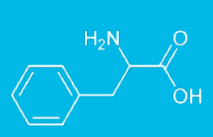
Ser

S
105.09
87.08
$C_3H_7NO_3$
Serine

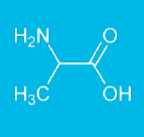
Basic
Nonpolar (hydrophobic)
Polar, uncharged
Acidic

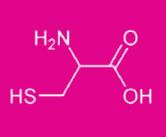
His

H
155.16
137.14
$C_6H_9N_3O_2$
Histidine

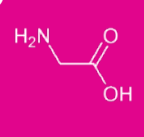
Asp

D
133.10
115.09
$C_4H_7NO_4$
Aspartic Acid

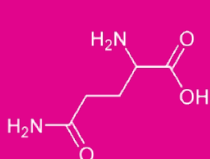
Arg

R
174.20
156.19
$C_6H_{14}N_4O_2$
Arginine

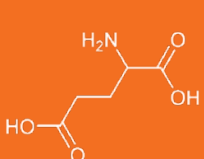
Phe

F
165.19
147.18
$C_9H_{11}NO_2$
Phenylalanine

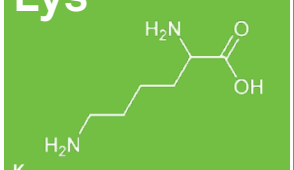
Ala

A
89.09
71.08
$C_3H_7NO_2$
Alanine

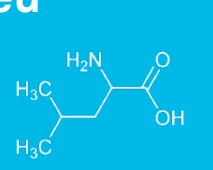
Cys

C
121.16
103.14
$C_3H_7NO_2S$
Cysteine

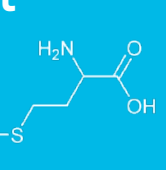
Gly

G
75.07
57.05
$C_2H_5NO_2$
Glycine

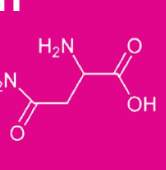
Gln

Q
146.15
128.13
$C_5H_{10}N_2O_3$
Glutamine

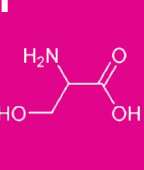
Glu

E
147.13
129.11
$C_5H_9NO_4$
Glutamic Acid

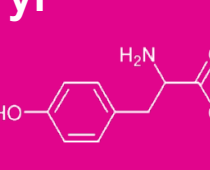
Lys

K
146.19
128.17
$C_6H_{14}N_2O_2$
Lysine

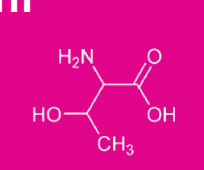
Leu

L
131.18
113.16
$C_6H_{13}NO_2$
Leucine

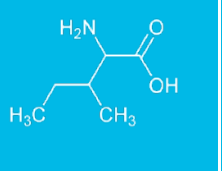
Met

M
149.21
131.20
$C_5H_{11}NO_2S$
Methionine

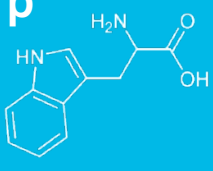
Asn

N
132.12
114.10
$C_4H_8N_2O_3$
Asparagine

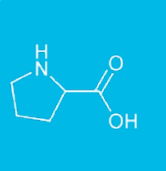
Ser

S
105.09
87.08
$C_3H_7NO_3$
Serine

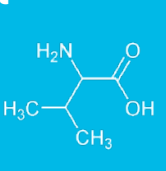
Tyr

Y
181.19
163.17
$C_9H_{11}NO_3$
Tyrosine

Thr

T
119.12
101.10
$C_4H_9NO_3$
Threonine

Ile

I
131.18
113.16
$C_6H_{13}NO_2$
Isoleucine

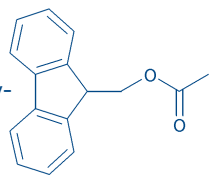
Trp

W
204.23
186.21
$C_{11}H_{12}N_2O_2$
Tryptophan

Pro

P
115.13
97.12
$C_5H_9NO_2$
Proline

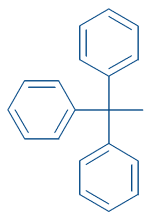
Val

V
117.15
99.13
$C_5H_{11}NO_2$
Valine

Common Fmoc-Strategy SPPS* Protecting Groups

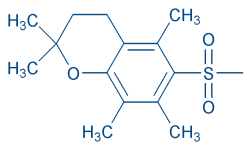
Fmoc
9-Fluorenylmethyloxy-carbonyl
M_r = 223.25



Trt
Trityl
M_r = 243.32

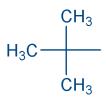


Pmc
2,2,5,7,8-Pentamethyl-chroman-6-sulfonyl
M_r = 267.37



EP 0 293 073 B1
US Patent 4,946,971
owned by Bachem

tBu
t-Butyl
M_r = 57.12



Absorption and Emission Characteristics of Chromophores and Fluorophores

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
4MβNA (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
CHROMOPHORE	**Extinction Wavelength**	**Molar Extinction Coefficient**
pNA (p-Nitroanilide)	405 nm 410 nm	$\varepsilon_{405\ nm}$ = 9450 $M^{-1}cm^{-1}$ $\varepsilon_{410\ nm}$ = 8800 $M^{-1}cm^{-1}$

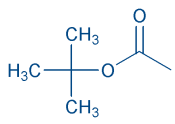
Values listed are as reported in the literature

*SPPS = Solid Phase Peptide Synthesis

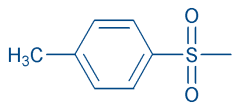
2002899 published by Global Marketing Bachem AG, January 2021

Common Boc-Strategy SPPS* Protecting Groups

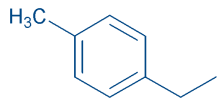
Boc
t-Butyloxycarbonyl
M_r = 101.13



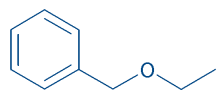
Tos
Tosyl
M_r = 155.20



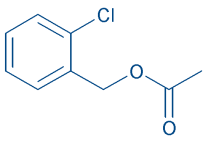
Mbzl
4-Methylbenzyl
M_r = 105.16



Bom
Benzyloxymethyl
M_r = 121.16



2-Chloro-Z
2-Chlorobenzyloxy-carbonyl
M_r = 169.59



For
Formyl
M_r = 29.02

BACHEM