

AMINO ACID CHART

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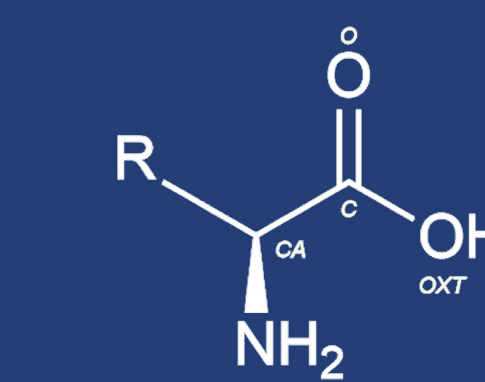
AMINO ACID CODE

POLARITY

MW BOUND g/mol
HYDROGEN DONOR OR ACCEPTOR

Volume Å³
(Size group)

Structures represented
at pH = 7



Propensity*
Alpha helix
Beta sheet

pKas:
• pKa N-ter
• pKa C-ter

* If the propensity value is >1, the amino acid favors the corresponding secondary structure. If <1, it disadvantages its formation.

aliphatic

GLYCINE GLY-G

NON POLAR

57.0 g/mol

60.1 Å³
(Very small)

1.0 α
1.7 β

pKas:
• N-ter: 9.6
• C-ter: 2.3

ALANINE ALA-A

NON POLAR

71.0 g/mol

88.6 Å³
(Very small)

1.4 α
0.7 β

pKas:
• N-ter: 9.6
• C-ter: 2.3

PROLINE PRO-P

NON POLAR

97.1 g/mol

112.7 Å³
(Small)

1.2 α
0.8 β

pKas:
• N-ter: 10.6
• C-ter: 1.9

VALINE VAL-V

NON POLAR

99.1 g/mol

140.0 Å³
(Medium)

0.9 α
1.3 β

pKas:
• N-ter: 9.6
• C-ter: 2.3

METHIONINE MET-M

NON POLAR

131.2 g/mol

162.9 Å³
(Large)

0.4 α
0.4 β

pKas:
• N-ter: 9.2
• C-ter: 2.2

LEUCINE LEU-L

NON POLAR

113.1 g/mol

166.7 Å³
(Large)

1.2 α
1.0 β

pKas:
• N-ter: 9.6
• C-ter: 2.3

ISOLEUCINE ILE-I

NON POLAR

113.1 g/mol

166.7 Å³
(Large)

1.2 α
1.1 β

pKas:
• N-ter: 9.6
• C-ter: 2.3

HISTIDINE HIS-H

POLAR UNCHARGED

137.1 g/mol
DONOR & ACCEPTOR

153.2 Å³
(Medium)

1.1 α
0.7 β

pKas:
• N-ter: 9.1
• C-ter: 1.8

basic/aromatic

basic

LYSINE LYS-K

POSITIVELY CHARGED

128.1 g/mol
DONOR

168.6 Å³
(Large)

0.7 α
0.6 β

pKas:
• N-ter: 8.9
• C-ter: 2.1

ARGININE ARG-A

POSITIVELY CHARGED

156.1 g/mol
DONOR

173.4 Å³
(Large)

0.8 α
1.3 β

pKas:
• N-ter: 9.0
• C-ter: 2.1

SERINE SER-S

POLAR UNCHARGED

87.0 g/mol
DONOR & ACCEPTOR

89.0 Å³
(Very small)

0.7 α
0.8 β

pKas:
• N-ter: 9.1
• C-ter: 2.2

CYSTEINE CYS-C

POLAR UNCHARGED

103.1 g/mol

108.5 Å³
(Small)

1.0 α
1.4 β

pKas:
• N-ter: 10.1
• C-ter: 1.9

neutral

THREONINE THR-T

POLAR UNCHARGED

101.1 g/mol
DONOR & ACCEPTOR

116.1 Å³
(Small)

0.7 α
1.2 β

pKas:
• N-ter: 9.1
• C-ter: 2.0

PHENYLALANINE PHE-F

NON POLAR

147.1 g/mol

189.9 Å³
(Very large)

1.2 α
0.7 β

pKas:
• N-ter: 9.1
• C-ter: 1.8

TYROSINE TYR-Y

POLAR UNCHARGED

163.1 g/mol
DONOR & ACCEPTOR

193.6 Å³
(Very large)

1.0 α
1.2 β

pKas:
• N-ter: 9.1
• C-ter: 2.2

TRYPTOPHAN TRP-W

NON POLAR

186.2 g/mol
DONOR

227.8 Å³
(Very large)

0.9 α
2.0 β

pKas:
• N-ter: 9.4
• C-ter: 2.8

aromatic

acidic

ASPARTIC ACID ASP-D

NEGATIVELY CHARGED

115.0 g/mol

111.1 Å³
(Small)

1.3 α
0.6 β

pKas:
• N-ter: 9.6
• C-ter: 1.8

GLUTAMIC ACID GLU-E

NEGATIVELY CHARGED

129.1 g/mol
ACCEPTOR

138.4 Å³
(Medium)

0.4 α
0.6 β

pKas:
• N-ter: 9.6
• C-ter: 2.1

neutral amide

ASPARAGINE ASN-N

POLAR UNCHARGED

114.1 g/mol
DONOR & ACCEPTOR

114.1 Å³
(Small)

0.8 α
0.5 β

pKas:
• N-ter: 8.8
• C-ter: 2.0

GLUTAMINE GLN-Q

POLAR UNCHARGED

128.1 g/mol
DONOR & ACCEPTOR

143.8 Å³
(Medium)

0.8 α
0.9 β

pKas:
• N-ter: 9.1
• C-ter: 8.8

BIBLIOGRAPHY

Nelson, D. L., & Cox, M. M. (2017). Lehninger principles of biochemistry (7th ed.). W.H. Freeman.

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