

# Amino Acid Table

Name			Residue Characters of Amino Acids				Characters of Amino Acids				
Full Name	3-letter Code	1-letter Code	Empirical Formula	Monoisotopic Mass <sup>1)</sup>	Average Mass <sup>1)</sup>	Side Chain [Nominal]	Structure	Type	Bull & Breese Index <sup>2)</sup>	Isoelectric Point	Occurrence in Protein
Glycine	Gly	G	C <sub>2</sub> H <sub>3</sub> NO	57.02146	57.052	1	H-	Apolar	810	5.97	
Alanine	Ala	A	C <sub>3</sub> H <sub>5</sub> NO	71.03711	71.079	15	CH <sub>3</sub> -	Apolar	610	6.00	
Serine	Ser	S	C <sub>3</sub> H <sub>5</sub> NO <sub>2</sub>	87.03203	87.078	31	HO-CH <sub>2</sub> -	Uncharged Polar	420	5.68	
Proline	Pro	P	C <sub>5</sub> H <sub>7</sub> NO	97.05276	97.116	--		Apolar	-170	6.30	
Valine	Val	V	C <sub>5</sub> H <sub>9</sub> NO	99.06841	99.132	43		Apolar	-750	5.96	
Threonine	Thr	T	C <sub>4</sub> H <sub>7</sub> NO <sub>2</sub>	101.04768	101.104	45		Uncharged Polar	290	6.16	
Cysteine	Cys	C	C <sub>3</sub> H <sub>5</sub> NOS	103.00918	103.145	47	HS-CH <sub>2</sub> -	Uncharged Polar	360	5.07	
Isoleucine	Ile	I	C <sub>6</sub> H <sub>11</sub> NO	113.08406	113.159	57		Apolar	-1450	6.02	
Leucine	Leu	L	C <sub>6</sub> H <sub>11</sub> NO	113.08406	113.159	57		Apolar	-1650	5.98	
Asparagine	Asn	N	C <sub>4</sub> H <sub>6</sub> N <sub>2</sub> O <sub>2</sub>	114.04293	114.103	58	H <sub>2</sub> NCOCH <sub>2</sub> -	Uncharged Polar	890	5.41	
Aspartic acid	Asp	D	C <sub>4</sub> H <sub>5</sub> NO <sub>3</sub>	115.02694	115.088	59		Charged Polar	610	<b>2.77</b>	
Glutamine	Gln	Q	C <sub>5</sub> H <sub>8</sub> N <sub>2</sub> O <sub>2</sub>	128.05858	128.130	72	H <sub>2</sub> NCOCH <sub>2</sub> CH <sub>2</sub> -	Uncharged Polar	970	5.65	
Lysine	Lys	K	C <sub>6</sub> H <sub>12</sub> N <sub>2</sub> O	128.09496	128.174	72		Charged Polar	460	<b>9.74</b>	
Glutamic acid	Glu	E	C <sub>5</sub> H <sub>7</sub> NO <sub>3</sub>	129.04259	129.114	73		Charged Polar	510	<b>3.22</b>	
Methionine	Met	M	C <sub>5</sub> H <sub>9</sub> NOS	131.04048	131.198	75	CH <sub>3</sub> -S-CH <sub>2</sub> CH <sub>2</sub> -	Apolar	-660	5.74	
Histidine	His	H	C <sub>6</sub> H <sub>7</sub> N <sub>3</sub> O	137.05891	137.141	81		Charged Polar	690	<b>7.59</b>	
Phenylalanine	Phe	F	C <sub>9</sub> H <sub>9</sub> NO	147.06841	147.176	91		Apolar	-1520	5.48	
Arginine	Arg	R	C <sub>6</sub> H <sub>12</sub> N <sub>4</sub> O	156.10111	156.188	100		Charged Polar	690	<b>10.76</b>	
Tyrosine	Tyr	Y	C <sub>9</sub> H <sub>9</sub> NO <sub>2</sub>	163.06333	163.175	107		Uncharged Polar	-1430	5.66	
Tryptophan	Trp	W	C <sub>11</sub> H <sub>10</sub> N <sub>2</sub> O	186.07931	186.213	130		Apolar	-1200	5.89	

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Element	Monoiso. Mass	Aver. Mass
H	1.00782504	1.0079
C	12.00000000	12.011
N	14.0030740	14.007
O	15.9949146	15.999
S	31.9720710	32.066

