

Table A. pKa Values of Common Amino Acids

Amino Acid	3-letter code	1-letter code	pKa $\alpha$ -COOH	$\square$ pKa $\alpha$ -NH <sub>3</sub> <sup>+</sup>	pKa R-group
Alanine	Ala	A	2.34	9.69	
Arginine	Arg	R	2.17	9.04	12.48
Asparagine	Asn	N	2.02	8.80	
Aspartic Acid	Asp	D	2.09	9.82	3.86
Cysteine	Cys	C	1.71	10.78	8.33
Glutamic Acid	Glu	E	2.19	9.67	4.25
Glutamine	Gln	Q	2.17	9.13	
Glycine	Gly	G	2.34	9.60	
Histidine	His	H	1.82	9.17	6.00
Isoleucine	Ile	I	2.36	9.68	
Leucine	Leu	L	2.36	9.68	
Lysine	Lys	K	2.18	8.95	10.53
Methionine	Met	M	2.28	9.21	
Phenylalanine	Phe	F	1.83	9.13	
Proline	Pro	P	1.99	10.60	
Serine	Ser	S	2.21	9.15	
Threonine	Thr	T	2.63	10.43	
Tryptophan	Trp	W	2.38	9.39	
Tyrosine	Tyr	Y	2.20	9.11	10.07
Valine	Val	V	2.32	9.62	