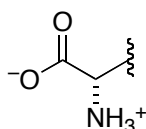

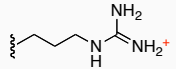
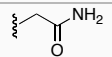
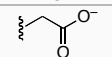

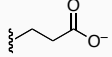
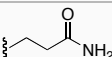

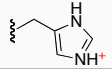


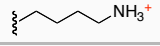
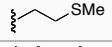
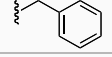



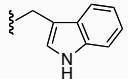
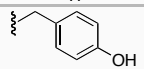



Amino Acid Side-Chain Properties



Amino Acid	3 Letter	1 Letter	Side chain	Charge at pH=7	pK _a
Alanine	Ala	A		neutral	-
Arginine	Arg	R		positive	12.48
Asparagine	Asn	N		neutral	-
Aspartic acid	Asp	D		negative	3.90
Cysteine	Cys	C		neutral	8.18
Glutamic acid	Glu	E		negative	4.07
Glutamine	Gln	Q		neutral	-
Glycine	Gly	G		neutral	-
Histidine	His	H		positive	6.04
Isoleucine	Ile	I		neutral	-
Leucine	Leu	L		neutral	-
Lysine	Lys	K		positive	10.54
Methionine	Met	M		neutral	-
Phenylalanine	Phe	F		neutral	-
Proline	Pro	P		neutral	-
Serine	Ser	S		neutral	-
Threonine	Thr	T		neutral	-
Tryptophan	Trp	W		neutral	-
Tyrosine	Tyr	Y		neutral	10.46
Valine	Val	V		neutral	-