TABLE 26-1 Natural (2S)-Amino Acids

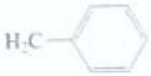
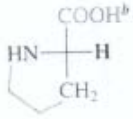
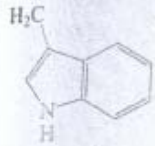
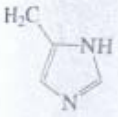
R	Name	Three-letter code	One-letter code	pK_a of α-COOH	pK_a of α-$^+NH_3$	pK_a of acidic function in R	Isoelectric point, pI
H	Glycine	Gly	G	2.3	9.6	—	6.0
Alkyl group							
CH_3	Alanine	Ala	A	2.3	9.7	—	6.0
$CH(CH_3)_2$	Valine[a]	Val	V	2.3	9.6	—	6.0
$CH_2CH(CH_3)_2$	Leucine[a]	Leu	L	2.4	9.6	—	6.0
$CHCH_2CH_3$ (*S*) $\lvert$ CH_3	Isoleucine[a]	Ile	I	2.4	9.6	—	6.0
	Phenylalanine[a]	Phe	F	1.8	9.1	—	5.5
	Proline	Pro	P	2.0	10.6	—	6.3
Hydroxy-containing							
CH_2OH	Serine	Ser	S	2.2	9.2	—	5.7
$CHOH$ (*R*) $\lvert$ CH_3	Threonine[a]	Thr	T	2.1	9.1	—	5.6
	Tyrosine	Tyr	Y	2.2	9.1	10.1	5.7
Amino-containing							
$CH_2\overset{O}{\overset{\parallel}{C}}NH_2$	Asparagine	Asn	N	2.0	8.8	—	5.4
$CH_2CH_2\overset{O}{\overset{\parallel}{C}}NH_2$	Glutamine	Gln	Q	2.2	9.1	—	5.7
$(CH_2)_4NH_2$	Lysine[a]	Lys	K	2.2	9.0	10.5[c]	9.7
$(CH_2)_3NH\overset{NH}{\overset{\parallel}{C}}NH_2$	Arginine[a]	Arg	R	2.2	9.0	12.5[c]	10.8

TABLE 26-1 | **Natural (2*S*)-Amino Acids (*continued*)**

R	Name	Three-letter code	One-letter code	pK_a of α-COOH	pK_a of α-NH_3^+	pK_a of acidic function in R	Isoelectric point, pI
Amino-containing *(continued)*							
	Tryptophan[a]	Trp	W	2.8	9.4	—	5.9
	Histidine[a]	His	H	1.8	9.2	6.1[c]	7.6
Mercapto- or sulfide-containing							
CH_2SH	Cysteine[d]	Cys	C	2.0	10.3	8.2	5.1
$CH_2CH_2SCH_3$	Methionine[a]	Met	M	2.3	9.2	—	5.7
Carboxy-containing							
CH_2COOH	Aspartic acid	Asp	D	1.9	9.6	3.7	2.8
CH_2CH_2COOH	Glutamic acid	Glu	E	2.2	9.7	4.3	3.2

[a]Essential amino acids. [b]Entire structure. [c]pK_a of conjugate acid. [d]The stereocenter is *R*, because the CH_2SH substituent has higher priority than the COOH group.