TABLE OF AMINO ACIDS

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| --- | --- | --- | --- |
| SERINE |  | GLYCINE |  |
| THREONINE |  | ALANINE |  |
| TYROSINE |  | CYSTEINE |  |
| ASPARAGINE |  | VALINE |  |
| GLUTAMINE |  | LEUCINE |  |
| ISOLEUCINE |  | PROLINE |  |
| METHIONINE |  | PHENYLALANINE |  |
| TRYPTOPHAN |  | LYSINE |  |
| ASPARTIC ACID |  | ARGININE |  |
| GLUTAMIC ACID |  | HISTIDINE |  |

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| Name | Abbreviations | Molecular Formula | Isoelectric Point |
| Alanine | [Ala](http://www.imb-jena.de/IMAGE/aa/indiv/alanine_ALA_A.gif) | A | C3H7NO2 | 6.11 |
| Arginine | [Arg](http://www.imb-jena.de/IMAGE/aa/indiv/arginine_ARG_R.gif) | R | C6H14N4O2 | 10.76 |
| Asparagine | [Asn](http://www.imb-jena.de/IMAGE/aa/indiv/asparagine_ASN_N.gif) | N | C4H8N2O3 | 2.98 |
| Aspartic acid | [Asp](http://www.imb-jena.de/IMAGE/aa/indiv/aspartate_ASP_D.gif) | D | C4H7NO4 | 2.77 |
| Cysteine | [Cys](http://www.imb-jena.de/IMAGE/aa/indiv/cysteine_CYS_C.gif) | C | C3H7NO2S | 5.02 |
| Glutamine | [Gln](http://www.imb-jena.de/IMAGE/aa/indiv/glutamine_GLN_Q.gif) | Q | C5H10N2O3 | 3.08 |
| Glutamic acid | [Glu](http://www.imb-jena.de/IMAGE/aa/indiv/glutamate_GLU_E.gif) | E | C5H9NO4 | 3.22 |
| Glycine | [Gly](http://www.imb-jena.de/IMAGE/aa/indiv/glycine_GLY_G.gif) | G | C2H5NO2 | 6.06 |
| Histidine | [His](http://www.imb-jena.de/IMAGE/aa/indiv/histidine_HIS_H.gif) | H | C6H9N3O2 | 7.64 |
| Isoleucine | [Ile](http://www.imb-jena.de/IMAGE/aa/indiv/isoleucine_ILE_I.gif) | I | C6H13NO2 | 6.04 |
| Leucine | [Leu](http://www.imb-jena.de/IMAGE/aa/indiv/leucine_LEU_L.gif) | L | C6H13NO2 | 6.04 |
| Lysine | [Lys](http://www.imb-jena.de/IMAGE/aa/indiv/lysine_LYS_K.gif) | K | C6H14N2O2 | 9.47 |
| Methionine | [Met](http://www.imb-jena.de/IMAGE/aa/indiv/methionine_MET_M.gif) | M | C5H11NO2S | 5.74 |
| Phenylalanine | [Phe](http://www.imb-jena.de/IMAGE/aa/indiv/phenylalanine_PHE_F.gif) | F | C9H11NO2 | 5.91 |
| Proline | [Pro](http://www.imb-jena.de/IMAGE/aa/indiv/proline_PRO_P.gif) | P | C5H9NO2 | 6.30 |
| Serine | [Ser](http://www.imb-jena.de/IMAGE/aa/indiv/serine_SER_S.gif) | S | C3H7NO3 | 5.68 |
| Threonine | [Thr](http://www.imb-jena.de/IMAGE/aa/indiv/threonine_THR_T.gif) | T | C4H9NO3 | 5.64 |
| Tryptophan | [Trp](http://www.imb-jena.de/IMAGE/aa/indiv/tryptophan_TRP_W.gif) | W | C11H12N2O2 | 5.88 |
| Tyrosine | [Tyr](http://www.imb-jena.de/IMAGE/aa/indiv/tyrosine_TYR_Y.gif) | Y | C9H11NO3 | 5.63 |
| Valine | [Val](http://www.imb-jena.de/IMAGE/aa/indiv/valine_VAL_V.gif) | V | C5H11NO2 | 6.00 |

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| **Amino Acid Name** | **3-letter Code** | **1-letter Code** |
| [Alanine](http://webbook.nist.gov/cgi/cbook.cgi?Name=alanine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Ala](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/alanine_ALA_A.gif) | [A](http://jenalib.fli-leibniz.de/vrml/amino_acids/alanine_ALA_A_1.wrz) |
| [Arginine](http://webbook.nist.gov/cgi/cbook.cgi?Name=arginine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Arg](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/arginine_ARG_R.gif) | [R](http://jenalib.fli-leibniz.de/vrml/amino_acids/arginine_ARG_R_1.wrz) |
| [Aspartic Acid](http://webbook.nist.gov/cgi/cbook.cgi?Name=aspartic+acid&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Asp](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/aspartate_ASP_D.gif) | [D](http://jenalib.fli-leibniz.de/vrml/amino_acids/aspartate_ASP_D_1.wrz) |
| [Asparagine](http://webbook.nist.gov/cgi/cbook.cgi?Name=asparagine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Asn](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/asparagine_ASN_N.gif) | [N](http://jenalib.fli-leibniz.de/vrml/amino_acids/asparagine_ASN_N_1.wrz) |
| [Cysteine](http://webbook.nist.gov/cgi/cbook.cgi?Name=cysteine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Cys](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/cysteine_CYS_C.gif) | [C](http://jenalib.fli-leibniz.de/vrml/amino_acids/cysteine_CYS_C_1.wrz) |
| [Glutamic Acid](http://webbook.nist.gov/cgi/cbook.cgi?Name=glutaminic+acid&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Glu](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/glutamate_GLU_E.gif) | [E](http://jenalib.fli-leibniz.de/vrml/amino_acids/glutamate_GLU_E_1.wrz) |
| [Glutamine](http://webbook.nist.gov/cgi/cbook.cgi?Name=glutamine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Gln](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/glutamine_GLN_Q.gif) | [Q](http://jenalib.fli-leibniz.de/vrml/amino_acids/glutamine_GLN_Q_1.wrz) |
| [Glycine](http://webbook.nist.gov/cgi/cbook.cgi?Name=glycine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Gly](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/glycine_GLY_G.gif) | [G](http://jenalib.fli-leibniz.de/vrml/amino_acids/glycine_GLY_G_1.wrz) |
| [Histidine](http://webbook.nist.gov/cgi/cbook.cgi?Name=histidine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [His](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/histidine_HIS_H.gif) | [H](http://jenalib.fli-leibniz.de/vrml/amino_acids/histidine_HIS_H.wrz) |
| [Isoleucine](http://webbook.nist.gov/cgi/cbook.cgi?Name=isoleucine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Ile](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/isoleucine_ILE_I.gif) | [I](http://jenalib.fli-leibniz.de/vrml/amino_acids/isoleucine_ILE_I_1.wrz) |
| [Leucine](http://webbook.nist.gov/cgi/cbook.cgi?Name=leucine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Leu](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/leucine_LEU_L.gif) | [L](http://jenalib.fli-leibniz.de/vrml/amino_acids/leucine_LEU_L_1.wrz) |
| [Lysine](http://webbook.nist.gov/cgi/cbook.cgi?Name=lysine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Lys](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/lysine_LYS_K.gif) | [K](http://jenalib.fli-leibniz.de/vrml/amino_acids/lysine_LYS_K_1.wrz) |
| [Methionine](http://webbook.nist.gov/cgi/cbook.cgi?Name=methionine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Met](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/methionine_MET_M.gif) | [M](http://jenalib.fli-leibniz.de/vrml/amino_acids/methionine_MET_M_1.wrz) |
| [Phenylalanine](http://webbook.nist.gov/cgi/cbook.cgi?Name=phenylalanine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Phe](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/phenylalanine_PHE_F.gif) | [F](http://jenalib.fli-leibniz.de/vrml/amino_acids/phenylalanine_PHE_F_1.wrz) |
| [Proline](http://webbook.nist.gov/cgi/cbook.cgi?Name=proline&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Pro](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/proline_PRO_P.gif) | [P](http://jenalib.fli-leibniz.de/vrml/amino_acids/proline_PRO_P_1.wrz) |
| [Serine](http://webbook.nist.gov/cgi/cbook.cgi?Name=serine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Ser](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/serine_SER_S.gif) | [S](http://jenalib.fli-leibniz.de/vrml/amino_acids/serine_SER_S_1.wrz) |
| [Threonine](http://webbook.nist.gov/cgi/cbook.cgi?Name=threonine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Thr](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/threonine_THR_T.gif) | [T](http://jenalib.fli-leibniz.de/vrml/amino_acids/threonine_THR_T_1.wrz) |
| [Tryptophan](http://webbook.nist.gov/cgi/cbook.cgi?Name=tryptophan&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Trp](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/tryptophan_TRP_W.gif) | [W](http://jenalib.fli-leibniz.de/vrml/amino_acids/tryptophan_TRP_W_1.wrz) |
| [Tyrosine](http://webbook.nist.gov/cgi/cbook.cgi?Name=tyrosine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Tyr](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/tyrosine_TYR_Y.gif) | [Y](http://jenalib.fli-leibniz.de/vrml/amino_acids/tyrosine_TYR_Y_1.wrz) |
| [Valine](http://webbook.nist.gov/cgi/cbook.cgi?Name=valine&Units=SI&cTG=on&cIR=on&cTC=on&cMS=on&cTP=on&cUV=on&cTR=on&cES=on&cPI=on&cDI=on&cSO=on) | [Val](http://jenalib.fli-leibniz.de/IMAGE/aa/indiv/valine_VAL_V.gif) | [V](http://jenalib.fli-leibniz.de/vrml/amino_acids/valine_VAL_V_1.wrz) |