



Amino Acids and Peptides Database

This database contains 792 infrared spectra of amino acids, peptides, and compounds with the amino acid as a unit. This collection of substances with biological importance enables users to search compounds that contain these essential building blocks.

Amino acids are the building blocks of proteins. Twenty different amino acids are used to synthesize proteins. The shape and other properties of each protein are dictated by the precise sequence of amino acids in it. They can form short polymer chains called peptides or polypeptides which in turn form structures called proteins. There are 20 alpha-amino acids that are relevant to the make-up of mammalian proteins, as well as others found in the body free or in combined states. These non-protein associated amino acids perform specialized functions. Several of the amino acids found in proteins also serve functions distinct from the formation of peptides and proteins.

The alpha-amino acids in peptides and proteins (excluding proline) consist of a carboxylic acid (-COOH) and an amino (-NH₂) functional group attached to the same tetrahedral carbon atom. This carbon is the alpha-carbon. Distinct R-groups, that distinguish one amino acid from another, also are attached to the alpha-carbon (except in the case of glycine where the R-group is hydrogen). The fourth substitution on the tetrahedral alpha-carbon of amino acids is hydrogen.

Each compound in the database is identified by its chemical name and the method of analysis as well as structural formula, molecular formula, and molecular weight. Synonyms, melting points, boiling points, literature references, and comments may be displayed when available.

The main group of amino acids include:

Alanine	ala	CH ₃ -CH(NH ₂)-COOH
Arginine	arg	HN=C(NH ₂)-NH-(CH ₂) ₃ -CH(NH ₂)-COOH
Asparagine	asn	H ₂ N-CO-CH ₂ -CH(NH ₂)-COOH
Aspartic acid	asp	HOOC-CH ₂ -CH(NH ₂)-COOH
Cysteine	cys	HS-CH ₂ -CH(NH ₂)-COOH
Glutamine	gln	H ₂ N-CO-(CH ₂) ₂ -CH(NH ₂)-COOH
Glutamic acid	glu	HOOC-(CH ₂) ₂ -CH(NH ₂)-COOH
Glycine	gly	NH ₂ -CH ₂ -COOH
Histidine	his	$\text{NH}-\text{CH}=\text{N}-\text{CH}=\text{C}-\text{CH}_2-\text{CH}(\text{NH}_2)-\text{COOH}$
Isoleucine	ile	CH ₃ -CH ₂ -CH(CH ₃)-CH(NH ₂)-COOH
Leucine	leu	(CH ₃) ₂ -CH-CH ₂ -CH(NH ₂)-COOH
Lysine	lys	H ₂ N-(CH ₂) ₄ -CH(NH ₂)-COOH
Methionine	met	CH ₃ -S-(CH ₂) ₂ -CH(NH ₂)-COOH
Phenylalanine	phe	Ph-CH ₂ -CH(NH ₂)-COOH
Proline	pro	$\text{NH}-(\text{CH}_2)_3-\text{CH}-\text{COOH}$
Serine	ser	HO-CH ₂ -CH(NH ₂)-COOH
Threonine	thr	CH ₃ -CH(OH)-CH(NH ₂)-COOH
Tryptophan	trp	$\text{Ph}-\text{NH}-\text{CH}=\text{C}-\text{CH}_2-\text{CH}(\text{NH}_2)-\text{COOH}$
Tyrosine	tyr	HO-p-Ph-CH ₂ -CH(NH ₂)-COOH
Valine	val	(CH ₃) ₂ -CH-CH(NH ₂)-COOH

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