

CLASSIFICATION OF POLYPEPTIDES

Peptides are short chains of amino acid monomers linked by peptide (amide) bonds.

The covalent chemical bonds are formed when the carboxyl group of one amino acid reacts with the amino group of another. The shortest peptides are dipeptides, consisting of 2 amino acids joined by a single peptide bond, followed by tripeptides, tetrapeptides, etc.

A polypeptide is a long, continuous, and unbranched peptide chain. Peptides fall under the broad chemical classes of biological oligomers and polymers, alongside nucleic acids, oligosaccharides and polysaccharides, etc.

The IUPAC Gold book defines polypeptides as peptides containing ten or more amino acid residues.

Peptides are distinguished from proteins on the basis of size, and as an arbitrary benchmark can be understood to contain approximately 50 or fewer amino acids.

Peptides often act as hormones and thus constitute biologic messengers carrying information from one tissue through the blood to another. Two common classes of hormones are peptide and steroid hormones.

Polypeptides are classified at heading level by application of Note 3 to Chapter 29, and at subheading level by application of Subheading Note 1 to Chapter 29.

In accordance to Note 3 to Chapter 29, goods which could be included in two or more of the headings of this Chapter are to be classified in that one of those headings which occurs last in numerical order.

Where polypeptides have a physiological or biological function on the body, specified in Sub-Chapters XI to XIII of Chapter 29, such as polypeptide hormones (heading 29.37), they are classified in accordance to that function. Polypeptides not having a physiological or biological function, specified in Sub-Chapters XI to XIII of Chapter 29, are classified based on their chemical structures.

In practical terms, the classification of polypeptides which are classified based on their chemical structure, is governed by the classification of the amino acid that is classified last in numerical order.

It is necessary to know the chemical structure of each amino acid of the polypeptide to find which one is classified in the heading that occurs last in numerical order and to then, apply Subheading Note 1 to Chapter 29.

To help customs chemists in the classification of polypeptides, the Secretariat has included a list of the most common amino acids with information on their chemical names, chemical structures and HS classification, ordered by either, their one letter abbreviation or their HS codes in descending order.

Example of classification of Alirinetide (INN)

alirinetidum	
alirinetide	L-phenylalanyl-L-seryl-L-arginyl-L-tyrosyl-L-alanyl-L-arginine <i>neurological agent</i>
alirinétide	L-phénylalanyl-L-séryl-L-arginyl-L-tyrosyl-L-alanyl-L-arginine <i>agent neurologique</i>
alirinetida	L-fenilalanil-L-seril-L-arginil-L-tirosil-L-alanil-L-arginina <i>agente neurológico</i>
	$C_{36}H_{54}N_{12}O_9$ 725715-18-4
	H-Phe-Ser-Arg-Tyr-Ala-Arg-OH

Classification of each amino acid

Phe : 2922.49

Ser : 2922.50

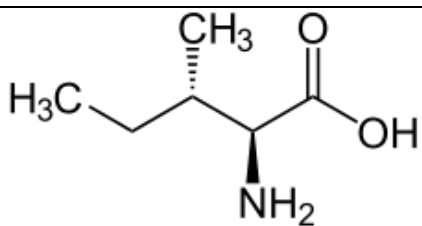
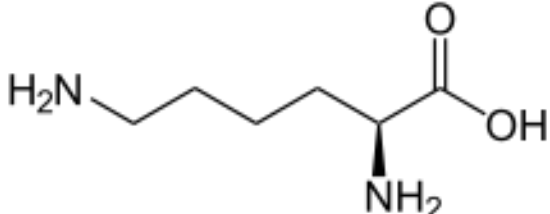
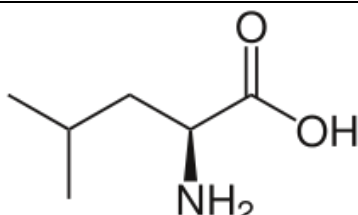
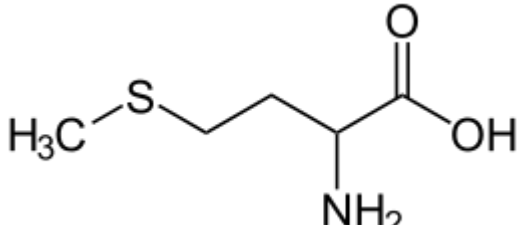
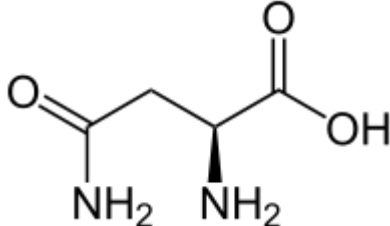
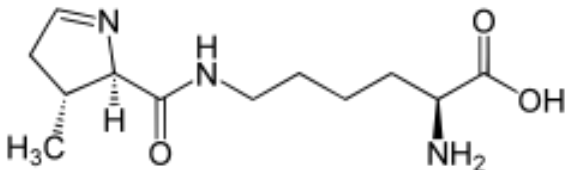
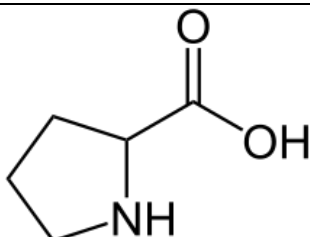
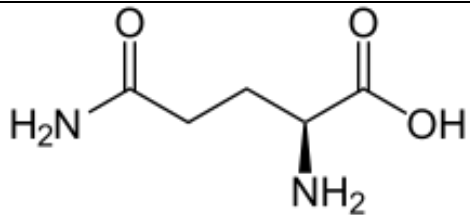
Arg : 2925.29

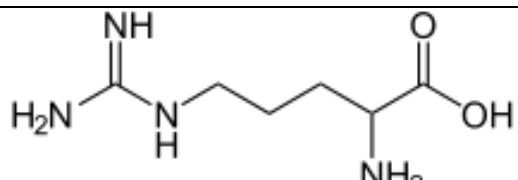
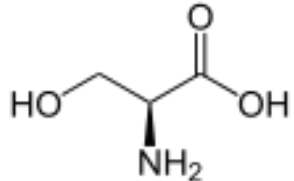
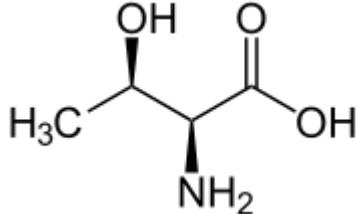
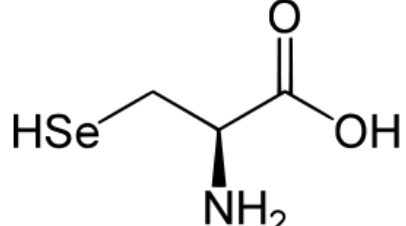
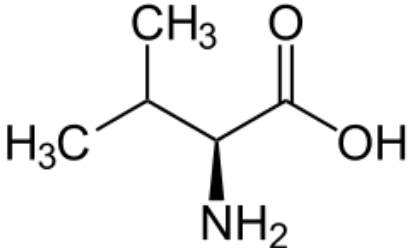
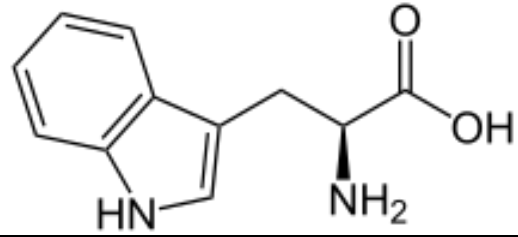
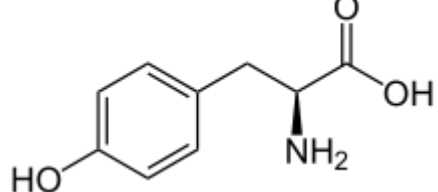
Tyr : 2922.50

Ala : 2922.49

AMINOACIDS ORDERED BY 1 LETTER ABBREVIATION

AMINOACID	1 LETTER	3 LETTERS	HS	STRUCTURE
Alanine	A	Ala	2922.49	
Cysteine	C	Cys	2930.90	
Aspartic acid	D	Asp	2922.49	
Glutamic acid	E	Glu	2922.42	
Phenylalanine	F	Phe	2922.49	
Glycine	G	Gly	2922.49	
Histidine	H	His	2933.29	

Isoleucine	I	Ile	2922.49	
Lysine	K	Lys	2922.41	
Leucine	L	Leu	2922.49	
Methionine	M	Met	2930.40	
Asparagine	N	Asn	2924.19	
Pyrrolysine	O	Pyl	2933.99	
Proline	P	Pro	2933.99	
Glutamine	Q	Gln	2924.19	

Arginine	R	Arg	2925.29	
Serine	S	Ser	2922.50	
Threonine	T	Thr	2922.50	
Selenocysteine	U	Sec	2931.90	
Valine	V	Val	2922.49	
Tryptophan	W	Trp	2933.99	
Tyrosine	Y	Tyr	2922.50	

AMINOACIDS ORDERED BY HS (IN DESCENDING ORDER)

AMINOACID	1 LETTER	3 LETTERS	HS
Pyrrolysine	O	Pyl	2933.99
Proline	P	Pro	2933.99
Tryptophan	W	Trp	2933.99
Histidine	H	His	2933.29
Selenocysteine	U	Sec	2931.90
Cysteine	C	Cys	2930.90
Methionine	M	Met	2930.40
Arginine	R	Arg	2925.29
Asparagine	N	Asn	2924.19
Glutamine	Q	Gln	2924.19
Serine	S	Ser	2922.50
Threonine	T	Thr	2922.50
Tyrosine	Y	Tyr	2922.50
Alanine	A	Ala	2922.49
Aspartic acid	D	Asp	2922.49
Phenylalanine	F	Phe	2922.49
Glycine	G	Gly	2922.49
Isoleucine	I	Ile	2922.49
Leucine	L	Leu	2922.49
Valine	V	Val	2922.49
Glutamic acid	E	Glu	2922.42
Lysine	K	Lys	2922.41