

Abbreviations and Symbols

Abbreviations are hindrances to readers in fields other than that of the author, to abstractors and to scientists in foreign countries. Therefore their use should be restricted to a minimum. On the other hand, it is sometimes convenient to use abbreviations or symbols for the names of chemical substances, particularly in equations, tables or figures. The limited use of abbreviations and symbols of specified meaning is therefore accepted. However, clarity and unambiguity are more important than brevity.

One of the most important areas of biochemistry for which special *symbols* are essential is that of biopolymers. It is almost impossible to represent the name of even a simple protein, polynucleotide, or polysaccharide except by the use of logical and universally accepted abbreviations. The name of, *e.g.*, one of the chains of insulin, expressed in terms of 30 amino-acid-radical names in order, is so unwieldy as to be useless. The symbolic representation gives the structure in two lines of print.

For some of the most important biochemical reagents, coenzymes, *etc.*, even shorter abbreviations are universally employed, *e.g.*, ATP, NAD, RNA. These abbreviations do not represent a chemical structure in the way that symbols do. The creation of such new abbreviations should therefore be restricted to an absolute minimum.

Other symbols or abbreviations than those listed in the IUPAC-IUB Rules should be used only in those situations where an objective case may be made for necessity; none should be used when pronouns and similar short terms may replace a long word or phrase. They should always be defined in each paper. Such *ad hoc* abbreviations and symbols should not conflict with known ones, or with the general principles. None should be introduced except when repeated use is required. If, in exceptional circumstances, symbols or abbreviations are used in the Summary, they should be defined in the Summary, as well as in the body of the paper.

There are three main series of *symbols for monomeric units*, those for amino acids, monosaccharides, and mononucleosides, of which the amino-acid series is the oldest. The monomeric units are generally designated by three-letter symbols—a capital followed by two lower-case letters. The abbreviations should not be used for the free monomers in the text of papers.

A standard treatment has been devised for the three groups of macromolecules which are built up from these units. Where the sequence of residues is known, the symbols are written in order and joined by short lines (dashes, hyphens). Where the sequence is not known, the group of symbols, separated by commas, is enclosed in parentheses. Example: Ala-Gly-(Met,Pro)-Lys means that the sequence of methionine and proline is unknown.

Macromolecules composed of repeating sequences may be represented by the prefix 'poly' or the subscript *n*, both indicating 'polymer of'. The symbols for the monomeric units of the sequence are enclosed in parentheses. Thus, poly(Lys) or (Lys)_{*n*} is polylysine, poly(Ala-Lys) or (Ala-Lys)_{*n*} is a linear polymer consisting of alanine and lysine in regular alternating sequence and poly(Ala,Lys) is the irregular random copolymer of equal amounts of these amino acids. Between poly and the parenthesis there is no intervening space or hyphen. The *n* may be replaced by a definite number, an average (*e.g.* 10), or a range (*e.g.* 8–12), as appropriate. 'Oligo' may replace 'poly' for short chains.

When *other abbreviations for chemical compounds* are needed, the maximum use should be made of standard chemical symbols (C, H, O, N, P, S, Na, Cl, *etc.*), numerical multiples (subscripts 2 and 3, not di or D or T *etc.*, as in Me₂SO, Me₃Si-) and of trivial names and their symbols (*e.g.* folate, P, Me, Pr, Bu, Ph, Ac).

Symbols may be combined to represent more complex symbols, such as Tos-Arg-OMe, in which the basic structure (arginine) remains recognisable.

Names of enzymes are not to be abbreviated except in terms of substrates for which accepted abbreviations exist (hence ATPase and RNase, but not LDH, GPDH, ACE, *etc.*).

Peptide Hormones. The IUPAC-IUB Commission on Biochemical Nomenclature (CBN) has recommended trivial names short enough to make abbreviations unnecessary, *e.g.* corticotropin (for ACTH), follitropin (for FSH), folliberin (for FSH-RF), *etc.* [1].

Class names, such as fatty acids, protein, virus, *etc.*, or short terms (poly, furan, folate, *etc.*) are not to be abbreviated even when an associated term is abbreviated or symbolised (*e.g.* poly(X), not PX; H₄folate, not THF).

No abbreviations should be used for terms such as 'central nervous system', 'red blood cells', or 'extra-cellular fluid'.

The following tables have been compiled to aid authors and readers. They list the symbols and abbreviations proposed in the various CBN documents already published. The biochemical journals accept most of the CBN recommendations.

The Editorial Office

Table 1. *Symbols for amino acids*

The symbols preceded by a plus sign may be used without definition. The use of the one-letter abbreviations (in brackets) should be restricted to comparisons of long sequences in tables, lists, or figures, and for such special use as tagging three-dimensional models of proteins. They should not be used in papers where the single-letter system for nucleoside sequences is employed, as in repeating codons. Di(α -amino acids) are listed in appendix B of reference [2]

Name	Symbol	Name	Symbol
Alanine	+ Ala (A)	Homocysteine	Hcy
Allohydroxylysine	aHyl	Homoserine	Hse
Alloisoleucine	aIle	Homoserine lactone	Hse >
Aminoacid residue	AA	Hydroxylysine	+ Hyl
2-Aminoadipic acid	Aad	Hydroxyproline	+ Hyp
3-Aminoadipic acid	β Aad	Isoleucine	+ Ile (I)
2-Aminobutyric acid	Abu	Leucine	+ Leu (L)
ϵ -Aminohexanoic acid	ϵ Ahx	Lysine	+ Lys (K)
3-Aminopropionic acid	β Ala	Methionine	+ Met (M)
Arginine	+ Arg (R)	Norleucine	Nle
Asparagine	+ Asn (N)	Norvaline	Nva
Aspartic acid	+ Asp (D)	Ornithine	+ Orn
Aspartic acid or asparagine	+ Asx (B)	Phenylalanine	+ Phe (F)
Cysteine (<i>cf.</i> half-cystine)	+ Cys (C)	Proline	+ Pro (P)
2,4-Diaminobutyric acid	A ₂ bu	5-Pyrrolidone-2-carboxylic acid (pyroglutamic acid; oxoproline)	< Glu
2,2-Diaminopimelic acid	A ₂ pm	Sarcosine	Sar
Glutamic acid	+ Glu (E)	Serine	+ Ser (S)
Glutamine	+ Gln (Q)	Threonine	+ Thr (T)
Glutamic acid or glutamine	+ Glx (Z)	Tryptophan	+ Trp (W)
Glycine	+ Gly (G)	Tyrosine	+ Tyr (Y)
Half-cystine (<i>cf.</i> cysteine)	+ Cys	Valine	+ Val (V)
Histidine	+ His (H)		

Table 2. *Symbols for substituents of amino acids and of reagents used for their modification*

These symbols should be defined

Name	Symbol	Name	Symbol
Acetyl-	Ac-	Cyclopentylloxycarbonyl-	Poc- or cPeOCO-
Aminoethyl-	Aet- or $-(CH_2)_2NH_2$	Diazoacetyl-	N ₂ Ac- or N ₂ CHCO-
Benzhydryl-	Bzh- or Ph ₂ CH-	Dihydro	H ₂
Benzimidazolyl-	Bza-	Diisopropyl fluorophosphate	(Pr ⁱ O) ₂ PO-F; Pr ₂ ⁱ P-F; iPr ₂ P-F, or Dip-F
Benzoyl-	Bz- or PhCO-	5-Dimethylaminonaphthalenesulfonyl-	Dns- or dansyl-
Benzyl-	Bzl- or PhCH ₂ -	Dimethyl sulfoxide	Me ₂ SO
Benzyloxy-	-OBzl or -OCH ₂ Ph	Dinitrophenyl-	N ₂ ph- or Dnp-
Benzyloxycarbonyl-	Cbz- or Z-	Diphenylmethoxy-	-OBzh or -OCHPh ₂
Benzylthiomethyl-	Btm- or PhSCH ₂ -	Diphenylmethyl-	Bzh- or Ph ₂ CH-
<i>p</i> -Bromobenzyloxycarbonyl-	Z(Br)-	5,5'-Dithio-bis(2-nitrobenzoic acid)	Nbs ₂
<i>t</i> -Butoxy-	-OBu ^t	Ethoxy-	-OEt or EtO-
Butoxycarbonyl-	Boc- or Bu ^t OCO-	Ethyl-	Et-
Butyl-	Bu-	<i>N</i> -Ethylmaleimide	MalNEt
Carbamoyl-	Cbm- or NH ₂ CO-	Fluorodinitrobenzene	N ₂ ph-F
Carbamoylmethyl-	Cam- or -CH ₂ CONH ₂	Hydroxyethyl-	-(CH ₂) ₂ OH
Carboxymethyl-	Cm- or -CH ₂ CO ₂ H	<i>p</i> -Iodophenylsulfonyl-	Ips-
1-Carboxy-2-nitrophenylthio-	Nbs-	Isopropylidene-	Me ₂ C <
<i>p</i> -Carboxyphenylmercuri-	-HgBzOH	Maleoyl-	Mal < or -Mal-
3-Carboxypropionyl- (<i>cf.</i> succinyl-)	Suc-	Maleyl-	Mal-
<i>p</i> -Chloromercuribenzoate	<i>p</i> Cl-HgBzO ⁻	Methoxy-	-OMe
Cyanomethoxy-	-OCH ₂ CN	<i>p</i> -Methoxybenzyloxycarbonyl-	Z(OMe)-
Cyclohexyl-	cHx-	<i>p</i> -Methoxyphenylazobenzyloxycarbonyl-	Mz-
Cyclopentyl-	cPe-		

Table 2. (Continued)

Name	Symbol
Methyl-	Me-
Methylthiocarbamoyl-	Mtc- or MeNHCS
<i>p</i> -Nitrobenzyloxycarbonyl-	Z(NO ₂)-
<i>p</i> -Nitrophenoxy-	-ONp
<i>o</i> -Nitrophenylthio-	Nps-
<i>p</i> -Nitrophenylthio-	Snp-
Pentyl-	Pe-
Phenyl-	Ph-
<i>p</i> -Phenylazobenzyloxycarbonyl-	Pz-
Phenylisothiocyanate	PhNCS
Phenylthiocarbamoyl-	PhNCS- or Ptc-
Phenylthio-	-SPh
Phenylthiohydantoin	> PhNCS
Phosphoric residue	<i>P</i> - or - <i>P</i>
Phthaloyl-	Pht < or -Pht-
Phthalyl-	Pht-
1-Piperidino-oxy-	-OPip
Pipsyl- (<i>p</i> -iodophenylsulfonyl-)	Ips-
Propyl-	Pr-
8-Quinolyloxy-	-OQu
Succinimido-oxy-	-ONSu
Succinyl- (<i>cf.</i> 3-carboxypropionyl-)	Suc < or -Suc-
Tetrahydro	H ₄
Tetrahydrofuran(yl-)	H ₄ furan(–)
Tetrahydropyran(yl-)	H ₄ pyran(–)
Tosyl- (<i>p</i> -toluenesulfonyl-)	Tos-
Trifluoroacetyl-	CF ₃ CO-
Trimethylsilyl-	Me ₃ Si-
Triphenylmethyl-	Ph ₃ C- or Trt-

Table 3. *Symbols for carbohydrates*

This table lists the most commonly used symbols for carbohydrates; those preceded by a plus sign may be used without definition. Pyranose and furanose forms are designated where necessary by the suffixes *p* and *f*. Configurational symbols *D* and *L* (small Roman capital letters) and anomeric prefixes are shown where necessary as prefixes

Carbohydrate	Symbol
<i>N</i> -Acetylneuraminic acid	AcNeu
Fructose	+ Fru
Galactose	+ Gal
Glucose	+ Glc
Mannose	+ Man
Muramic acid	Mur
Neuraminic acid	Neu
Ribose	+ Rib
Sialic acid	Sia
<i>Derivatives of, e.g., glucose</i>	
<i>N</i> -Acetylglucosamine	GlcNAc
Glucosamine	GlcN
2-Deoxyglucose	dGlc ^a
Gluconic acid	GlcA
Glucuronic acid	GlcUA

^a The prefix 'd' indicates a 2-deoxysugar. Other deoxysugars may be designated similarly with a positional numeral, *e.g.*, 3-deoxyglucose: 3-dGlc.

Table 4. *Symbols for bases*

These symbols should be defined

Base	Symbol
Adenine	Ade
'a base'	Base
Cytosine	Cyt
Guanine	Gua
Hypoxanthine	Hyp
6-Mercaptopurine (thiohypoxanthine)	Shy
Orotate	Oro
'a purine'	Pur
'a pyrimidine'	Pyr
Thiouracil	Sur
Thymine	Thy
Uracil	Ura
Xanthine	Xan

Table 5. *Symbols for nucleosides and nucleotides*

The symbols preceded by a plus sign may be used without definition. Two systems are recognised, one using three-letter symbols for the common nucleosides and a capital italic *P* for the phosphoric residue, the other using single capital letters for the common nucleosides and a lower-case *p* for the phosphoric residue. The three-letter symbols should be used whenever chemical changes involving nucleosides or nucleotides are being discussed. The one-letter symbols are intended for the nucleoside residues in sequences or partial sequences only; in these they should always be connected by hyphens (for internal phosphodiester 3'–5' linkages) and the terminal phosphoric residue should be indicated by *p*. The 2'-deoxyribonucleosides are indicated by the prefix 'd'

Nucleoside	Symbol	
	Three-letter	One-letter
Adenosine	+ Ado	+ A
Bromouridine	BrUrd	B
Cytidine	+ Cyd	+ C
Dihydrouridine		D or hU
Guanosine	+ Guo	+ G
Inosine	+ Ino	+ I
6-Mercaptopurine ribonucleoside		
(6-thioinosine)	Sno	M or sl
'a nucleoside'	Nuc	N
Orotidine	Oro	O
Pseudouridine	+ Ψrd	+ Ψ or Q ^a
'a puridine nucleoside'	Puo	R
'a pyrimidine nucleoside'	Pyd	Y
Ribosylnicotinamide	Nir	
Ribosylthymine	+ Thd	+ T
Thiouridine	Srd	S or sU
Thymidine (2'-deoxyribosylthymine)	+ dThd	+ dT
Uridine	+ Urd	+ U
Xanthosine	+ Xao	+ X
Phosphoric residue	- <i>P</i>	<i>p</i> or – ^b

^a For computer work.

^b For internal phosphodiester bonds.

Table 6. Symbols for modified bases, sugars, or phosphoric acid residues in polynucleotides

a) Substituents on bases and internal sugars. These symbols, all in lower-case letters, generally precede the nucleoside letter for base substitution and follow the nucleoside letter for sugar substitution. Locants are given as superscripts, multipliers as subscripts

Name	Symbol
Acetyl-	ac
Amino-	n
Aminoacyl-	aa
Anisoyl-	an
Arabinose	a ^a
Aza-	z
Benzhydryl-	bh
Benzoyl-	bz
Benzyl-	bzl
Bromo-	br
Chloro-	cl
N-Cyclohexyl-N'-[β-(4-methylmorpholino)amidino]-	cmc
Dansyl-	dns
Deamino-	o
Deaza-	c
Deoxyribose	d ^b
Dihydro-	h (not h ₂)
Dimethoxytrityl-	dmt
Ethyl-	e
Fluoro-	fl
Formyl-	f
Formylaminoacyl-	fa
Hydroxy-	ho or oh
Hydroxymethyl-	hm
Iodo-	io
Isopentyl-	i
Lyxose	l ^a
Methyl-	m
Monomethyltrityl-	mmt
Tetrahydropyranyl-	thp
Thio-	s
Tosyl-	tos
Phosphoric residue	p ^c
Trityl-	tr
Xylose	x ^a

Table 7. Symbols for specific preparations of nucleic acids
These symbols may be used without definition

Name	Symbol
Complementary DNA	cDNA
Complementary RNA	cRNA
Messenger RNA	mRNA
Mitochondrial DNA	mtDNA
Mitochondrial RNA	mtRNA
Nuclear DNA	nDNA
Nuclear RNA	nRNA
Ribosomal RNA	rRNA
Transfer RNA	tRNA
<i>Specific transfer RNA species</i>	
Alanine-accepting tRNA	tRNA ^{Ala}
Aminoacylated alanine-accepting tRNA	Ala-tRNA ^{Ala}
Isoacceptor species	
of alanine-accepting tRNA	tRNA ^{Ala} ₁ , tRNA ^{Ala} ₂ , etc.
Methionine-accepting tRNA	tRNA ^{Met}
Formylatable methionine-accepting tRNA	tRNA ^{fMet} or tRNA ^{Met} _f
Formylaminoacylated formylatable methionine-accepting tRNA	fMet-tRNA ^{fMet} or fMet-tRNA ^{Met} _f

b) Substituents on terminal sugar hydroxyl groups, and phosphoric acid protecting groups. These symbols, generally placed in parentheses, follow the appropriate nucleoside symbol or adjoin the appropriate symbol for the phosphoric acid residue

Name	Symbol
Aminoacyl-	(AA)
Anisyl-	(MeOPh)
Benzhydryl-	(Ph ₂ CH)
Benzyl-	(Bzl)
Borate	(>BOH)
Carbonyl	(>CO)
5'-Cyanoethyl-; 3' (or 2') -cyanoethyl-	(CNEt)-; -(CNEt)
Dimethoxytrityl-	[(MeO) ₂ Tr]
1-Ethoxyethyl-	(EtOEt)
Ethoxymethyl-	(EtOMe)
Ethyl-	(Et)
Glycyl-	(Gly)
Leucyl-	(Leu)
Isopropylidene-	(>CMe ₂)
Methyl-	(Me)
Monomethyltrityl-	(MeOTr)
Phenyl-	(Ph)
Tetrahydropyranyl-	(Thp)
Tosyl-	(Tos)
Trifluoroacetyl-	F ₃ CCO-
Trityl-	(Tr)

^a Precedes the nucleoside letter.

^b May precede the nucleoside letter or the whole chain, as appropriate.

^c Precedes the nucleoside letter for 5'; follows the letter for 3'; > or > p for 2':3'-cyclic phosphoric acid residue; replaced by hyphen for internal phosphodiester bond.

Table 8. Miscellaneous symbols
These symbols should be defined

Name	Symbol
Cobalamin	Cbl
Cobamide	Cba
Cobinamide	Cbi
Corrin	Crn
Ferredoxin	Fd
Menaquinone	MK ^a
Plastoquinone	PQ ^a
Phosphoric residue	P- or -P
Phylloquinone	K ^a
Pteric acid (pteroyl-)	Pte
Pteroylglutamic acid ^b	PteGlu
Pyridoxyl-	Pxy-
Pyridoxylidene=	Pxd=
Tocopherol	T ^a
Tocopherolquinone	TQ ^a
N ² -Tosylarginine methyl ester	Tos-Arg-OMe
N-Tosylphenylalanine chloromethyl ketone ^c	Tos-PheCH ₂ Cl
Ubiquinone	Q ^a

^a See reference [2] for the special application of these symbols.

^b Folate and folyl- are not abbreviated.

^c Correctly (2-phenyl-1-tosylamido)ethyl chloromethyl ketone, or chloro-(N-tosylphenylalanyl)methane.

Table 9. *Abbreviations for semisystematic or trivial names*

Those abbreviations preceded by a plus sign may be used without definition. The preceding tables list alternative symbols that may be preferred by some journals. Trivial names for peptide hormones have been recommended [1]

Name	Abbreviation
Acetyl-coenzyme A	+ CoASAc
Adenosine 5'-mono-, di-, and triphosphates	+ AMP, ADP, and ATP ^a
O-(Carboxymethyl)-cellulose	CM-cellulose
Coenzyme A	+ CoA (or CoASH)
Corticotropin (adrenocorticotropin, adrenocorticotropic hormone)	ACTH ^b
Cytidine 5'-mono-, di-, and triphosphates	+ CMP, CDP, and CTP ^a
Deoxyribonucleic acid, or deoxyribonucleate	+ DNA
O-(Diethylaminoethyl)-cellulose	+ DEAE-cellulose
3,4-Dihydroxyphenylalanine	DOPA ^c
Diisopropyl fluorophosphate	DFP ^c
2,3-Dimercaptopropanol	BAL ^c
2,4-Dinitrophenyl-	DNP- ^c
Diphosphopyridine nucleotide	DPN ^d
Diphosphothiamin (thiamin pyrophosphate)	DPT ^c
Ethylenediamine tetraacetate	+ EDTA
Flavin-adenine dinucleotide	+ FAD
1-Fluoro-2,4-dinitrobenzene	FDNB ^c
Glutathione and its oxidised form	+ GSH, GSSG
Guanosine 5'-mono-, di-, and triphosphates	+ GMP, GDP, and GTP ^a
Haemoglobin, carbon monoxide haemoglobin, oxyhaemoglobin	Hb, HbCO, HbO ₂
Inorganic orthophosphate	+ P _i
Inorganic pyrophosphate	+ PP _i
Inosine 5'-mono-, di-, and triphosphates	+ IMP, IDP, and ITP ^a
Melanotropin (melanocyte-stimulating hormone)	MSH ^b
Methemoglobin, metmyoglobin	MetHb, MetMb
Myoglobin, carbon monoxide myoglobin, oxymyoglobin	Mb, MbCO, MbO ₂
Nicotinamide-adenine dinucleotide and its oxidised and reduced forms	+ NAD, NAD ⁺ , and NADH
Nicotinamide-adenine dinucleotide phosphate and its oxidised and reduced forms	+ NADP, NADP ⁺ , and NADPH
Nicotinamide mononucleotide	+ NMN
Riboflavin 5'-phosphate	+ FMN
Ribonucleic acid or ribonucleate	+ RNA
Ribosylthymine 5'-mono-, di-, and triphosphates	+ TMP, TDP, and TTP ^a
Thymidine 5'-mono-, di-, and triphosphates	+ dTMP, dTDP, and dTTP ^a
1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane	DDT
O-(Triethylaminoethyl)-cellulose	TEAE-cellulose
Triphosphopyridine nucleotide	TPN ^d
Tris(hydroxymethyl)aminomethane	+ Tris
Uridine 5'-mono-, di-, and triphosphates	+ UMP, UDP, and UTP ^a
Uridinediphosphoglucose	+ UDPG

^a The d prefix may be used to represent the corresponding deoxyribonucleoside phosphates, e.g. dADP. The various isomers of adenosine monophosphate may be written 2'-AMP, 3'-AMP, or 5'-AMP (in case of possible ambiguity). A similar procedure may be applied to other nucleoside or deoxyribonucleoside monophosphates.

^b This journal prefers the trivial name [1].

^c This journal prefers not to use this abbreviation.

^d This journal prefers NAD and NADP.

REFERENCES

1. IUPAC-IUB Commission on Biochemical Nomenclature (1975) Nomenclature of Peptide Hormones, Recommendations, 1974, *Eur. J. Biochem.* 55, 485–486.
2. IUPAC Commission on the Nomenclature of Organic Chemistry and IUPAC-IUB Commission on Biochemical Nomenclature (1975) Nomenclature of α -Amino Acids, Recommendations, 1974, *Eur. J. Biochem.* 53, 1–14.
3. IUPAC-IUB Commission on Biochemical Nomenclature (1975) Nomenclature of Quinones with Isoprenoid Side-chains, Recommendations, 1973, *Eur. J. Biochem.* 53, 15–18.

Reprints of this document may be obtained from the Editorial Office of the Journal, Boulevard de la Constitution, 69 (Bte 054), B-4020 Liège, Belgium

Tentative rules and recommendations of the IUPAC-IUB Commission on Biochemical Nomenclature (CBN), of the IUB Commission of Editors of Biochemical Journals (CEBJ) and of other international unions

These documents (as well as a document, OBN-5, describing the (American) Office of Biochemical Nomenclature, and listing other rules affecting biochemical nomenclature) are available from Dr Waldo E. Cohn, Director, N.R.C. Office of Biochemical Nomenclature, Oak Ridge National Laboratory, P. O. Box Y, Oak Ridge, Tennessee, U.S.A. 37830. *Collected Tentative Rules and Recommendations of the IUPAC-IUB Commission on Biochemical Nomenclature*, 2nd edn, June 1975 (vi + 149 pages, paperbound, US \$3.00 per copy, postpaid; 20% discount on orders of ten or more copies to a single address) is available from the American Society of Biological Chemists, Inc., 9650 Rockville Pike, Bethesda, Maryland, U.S.A. 20014; remittance, in US dollars, must accompany orders

Group	Title	May be found in
General	Abbreviations and symbols for chemical names of special interest in biological chemistry	<i>Eur. J. Biochem.</i> 1, 259–266 (1967)
	Fundamental stereochemistry	<i>Eur. J. Biochem.</i> 18, 151–170 (1971)
	Citation of bibliographic references in biochemical journals	<i>Eur. J. Biochem.</i> 37, 201–202 (1973)
Amino acids, peptides, and proteins	Nomenclature of α -amino acids. Recommendations 1974	<i>Eur. J. Biochem.</i> 53, 1–14 (1975)
	Corrections	<i>Eur. J. Biochem.</i> 53, 1 (1975)
	Symbols for amino-acid derivatives and peptides. Recommendations 1971	<i>Eur. J. Biochem.</i> 27, 201–207 (1972)
	Corrections	<i>Eur. J. Biochem.</i> 45, 2 (1974)
	Rules for naming synthetic modification of natural peptides	<i>Eur. J. Biochem.</i> 1, 379–381 (1967)
	Amendments	<i>Eur. J. Biochem.</i> 45, 3 (1974)
	Abbreviated nomenclature of synthetic polypeptides (polymerized amino acids). Recommendations 1971	<i>Eur. J. Biochem.</i> 26, 301–304 (1972)
	A one-letter notation for amino-acid sequences ^a	<i>Eur. J. Biochem.</i> 5, 151–153 (1968)
	Abbreviations and symbols for the description of the conformation of polypeptide chains	<i>Eur. J. Biochem.</i> 17, 193–201 (1970)
	Nomenclature of iron-sulfur proteins	<i>Eur. J. Biochem.</i> 35, 1–2 (1973)
	Nomenclature of peptide hormones. Recommendations 1974	<i>Eur. J. Biochem.</i> 55, 485–486 (1975)
	Nomenclature of human immunoglobulins	<i>Eur. J. Biochem.</i> 45, 5–6 (1974)
Nucleotides and nucleic acids	Abbreviations and symbols for nucleic acids, polynucleotides and their constituents	<i>Eur. J. Biochem.</i> 15, 203–208 (1970)
	Corrections	<i>Eur. J. Biochem.</i> 25, 1 (1972)
Lipids, etc.	The nomenclature of lipids	<i>Eur. J. Biochem.</i> 2, 127–131 (1967)
	Amendments and corrections	<i>Eur. J. Biochem.</i> 12, 1 (1970)
	The nomenclature of steroids. Revised tentative rules ^b	<i>Eur. J. Biochem.</i> 10, 1–19 (1969)
	Amendments 1971 and corrections ^b	<i>Eur. J. Biochem.</i> 25, 1–3 (1972)
	Nomenclature of quinones with isoprenoid side-chains. Recommendations 1973	<i>Eur. J. Biochem.</i> 53, 15–18 (1975)
	Tentative rules for the nomenclature of carotenoids	<i>Eur. J. Biochem.</i> 25, 397–408 (1972)
	Amendments 1975	<i>Eur. J. Biochem.</i> 57, 1–7 (1975)
	Nomenclature of tocopherols and related compounds	<i>Eur. J. Biochem.</i> 46, 217–219 (1974)
Carbohydrates	Tentative rules for carbohydrate nomenclature. Part 1.	<i>Eur. J. Biochem.</i> 21, 455–477 (1971)
	Corrections	<i>Eur. J. Biochem.</i> 25, 4 (1972)
Cyclitols	Nomenclature of cyclitols	<i>Eur. J. Biochem.</i> 57, 1–7 (1975)
Folic acid	Nomenclature and symbols for folic acid and related compounds	<i>Eur. J. Biochem.</i> 2, 5–6 (1967)
Corrinoids	Nomenclature of corrinoids	<i>Eur. J. Biochem.</i> 45, 7–12 (1974)
Vitamin B-6 etc.	Nomenclature for vitamin B-6 and related compounds	<i>Eur. J. Biochem.</i> 40, 325–327 (1973)
Enzymes	<i>Enzyme nomenclature. Recommendations (1972)</i>	Elsevier Publishing Company, Amsterdam
	Nomenclature of multiple forms of enzymes	<i>Eur. J. Biochem.</i> 24, 1–3 (1971)
Miscellaneous (vitamins)	Trivial names of miscellaneous compounds of importance in biochemistry	<i>Eur. J. Biochem.</i> 2, 1–2 (1967)

^a Not for use in the text.

^b The Definitive Rules may be found in *Pure Appl. Chem.* 31, 285–322 (1972).