Dictionary Of Biochemistry

Stenesh

DICTIONARY OF BIOCHEMISTRY

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PREFACE

This dictionary was written to provide scientists and students in the life sciences with a reference work on the terminology of biochemistry. The dictionary contains approximately 12,000 entries drawn from over 200 textbooks and reference books of various kinds and from the research literature of biochemical journals; all of the source material consulted has been published since 1962. The recommendations of the Commission on Biochemical Nomenclature of the International Union of Pure and Applied Chemistry and the International Union of Biochemistry were among the sources used in the compilation of this dictionary.

The selection of entries was influenced by characteristics of the terminology of biochemistry. One of these characteristics is the extensive use of terms from other sciences, since biochemistry, by its very nature, draws heavily on allied sciences. For this reason, many terms from these sciences are included in the dictionary. The sciences emphasized most in this connection are chemistry, immunology, genetics, virology, biophysics, and bacteriology. A second characteristic is the extensive use of abbreviations, both standard and nonstandard. Many of these are included to aid the reader of biochemical literature and to account for the likelihood that some of the nonstandard abbreviations will become standard ones in the future. A third characteristic is the extensive use of synonymous expressions, frequently differing from each other only by minor variations. Since the synonymous nature of one expression to another may not always be apparent to the reader, principal synonymous expressions are included and cross-referenced.

An effort was made to include terms recently introduced into the biochemical literature and to exclude obsolete ones, except for a few of historical interest. While it was considered essential to include the names of specific compounds and other substances, no attempt was made to be exhaustive in this respect. Terms are generally defined in a concise manner except for those where a somewhat more expanded definition was considered to be useful; comprehensive, encyclopedic treatment was, however, purposely avoided.

I would like to acknowledge Drs. Irwin H. and Leigh D. Segel for their critical review of the manuscript, and Dr. Mary Conway and Dr. Robert Badger, my editors at Wiley-Interscience, for their cooperation and helpful suggestions. My thanks go to Mrs. Janet Springer and Mrs. Jamie Jeremy, secretaries of the Chemistry Department of Western Michigan University, for their typing of the manuscript. I am especially grateful to my wife, Mabel, for her advice pertaining to the technical aspects of lexicography and for her critical evaluation of style. Above all, I am indebted to her and to my son, Ilan, for helping to make this book a reality by willingly accepting the sacrifices which the work demanded.

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EXPLANATORY NOTES

Arrangement of Entries. The entries are arranged in alphabetical order, letter by letter; thus "acidimetry" precedes "acid number," and "waterfall sequence" precedes "water hydrate model." Identical alphabetical listings are entered so that lowercase letters precede capital ones and subscripts precede superscripts.

Chemical prefixes, in either abbreviated or unabbreviated form, are disregarded in alphabetizing when they are used in the ordinary sense of denoting structure of organic compounds. These include ortho-, meta-, para-, alpha-, beta-, gamma-, delta-, *cis*-, *trans*-, *N*-, *O*-, and *S*-. Such prefixes are, however, included in alphabetizing when they form integral parts of entries and are used in ways other than for the indication of structure of organic compounds, as in "alpha helix," "beta configuration," and "N-terminal." The prefixes mono-, di-, tri-, tetra-, and poly-, which form integral parts of entries, are included in alphabetizing, as in "monoglyceride" and "tetrahydrofolic acid."

All numbers are disregarded in alphabetizing; these include numbers denoting chemical structure, as in "glucose-6-phosphate dehydrogenase" and "5-HT," and numbers used for other purposes, as in "factor IV" and "S-100 fraction."

The letters D and L, denoting configuration, are omitted from names of terms as entered and are usually omitted from the definitions themselves.

Form of Entries. All entries are direct entries so that, for example, "first law of cancer biochemistry" is entered as such and not as "cancer biochemistry, first law of." The entries are generally in the singular, with the plural indicated only when considered necessary. When several parts of speech of a term are in use, the term is generally entered in the noun form, and other parts of speech are entered only to the extent deemed useful. The different meanings of a term are numbered, chemical formulas are generally omitted, and the spelling is American.

Cross References. Four types of cross-references are used in this dictionary; they are indicated by the use of *see, aka, see also,* all in italics, and by the use of words in capital letters. The word *see* is used either in a directive sense, as in "coat—*see* spore coat; viral coat" and "hereditary code—*see* genetic code," or to indicate that the term is defined within the definition of another, separately entered term, as in "E_0'—*see* standard electrode potential" and "MIH—*see* melanocyte-stimulating hormone regulatory hormone." The abbreviation *aka* (also known as) is used at the end of a definition to indicate expressions that are synonymous to the entry; principal synonymous expressions are entered separately in the text. The phrase *see also* is used at the end of a definition where it is considered useful to point out to the reader comparable, contrasting, or other kinds of related entries. Capital letters are used to indicate an expression that is synonymous to the entry and that is defined in its alphabetical place in the book. Thus the definition of the entry "amphiphilic" by the word "AMPHIPATHIC," and the definition of the entry "pentose oxidation cycle" by the

term "HEXOSE MONOPHOSPHATE SHUNT" indicate that the capitalized terms are expressions that are synonymous to the entries and that are themselves defined in their appropriate alphabetical places in the text.

Abbreviations and Symbols. The following standard abbreviations and symbols are used in this dictionary:

A	ampere
Å	angstrom unit
abbr	abbreviation
adj	adjective
adv	adverb
aka	also known as
atm	atmosphere
°C	degree centigrade
cc	cubic centimeter
cm	centimeter
cps	cycles per second
deg	degree
dm	decimeter
e.g.	for example
esu	electrostatic unit
g	gram
Icd	international candle
i.e.	that is
J	joule
kg	kilogram
l	liter
lb	pound
lm	lumen
m	meter
mg	milligram
min	minute
ml	milliliter
mm	millimeter
n	noun
nm	nanometer
pl	plural
sec	second
sym	symbol
v	verb
var sp	variant spelling
%	percent
μ	micro
Ω	ohm

Various letters of the Greek alphabet are also used in this dictionary. For completeness, the entire Greek alphabet is listed below:

Capital	Lowercase	Name
A	α	alpha
B	β	beta
Γ	γ	gamma
Δ	δ, ∂	delta
E	ϵ	epsilon
Z	ζ	zeta
H	η	eta
Θ	θ, ϑ	theta
I	$\imath$	iota
K	κ	kappa
Λ	λ	lambda
M	μ	mu
N	ν	nu
≅	ξ	xi
O	o	omicron
Π	π	pi
P	ρ	rho
Σ	σ, ς	sigma
T	τ	tau
ϒ	υ	upsilon
Φ	ϕ	phi
X	χ	chi
Ψ	ψ	psi
Ω	ω	omega

A

a. Atto.

A. 1. Adenine. 2. Adenosine. 3. Absorbance. 4. Angstrom unit. 5. Mass number. 6. Alanine. 7. Helmholtz free energy. 8. Ampere.

Å. Angstrom unit.

AA. Amino acid.

AA-AMP. Aminoacyl adenylate.

AAN. Amino acid nitrogen.

AA-tRNA. Aminoacyl transfer RNA.

AA-tRNA^{AA}. Aminoacyl transfer RNA; the prefix AA denotes the aminoacyl group attached to the transfer RNA molecule, while the superscript AA denotes the amino acid for which the transfer RNA is specific.

Ab. Antibody.

A band. A transverse dark band that is seen in electron microscope preparations of myofibrils from striated muscle and that consists of thick and thin filaments.

Abbe refractometer. A refractometer for the direct measurement of the refractive index of a solution.

ABC. Antigen binding capacity.

a × b × c code. An early version of the genetic code according to which there exist, respectively, *a*, *b*, and *c* distinguishable and nonequivalent bases for each of the three positions of the codon, so that the product $a \times b \times c$ is equal to the number of categories into which the triplet codons are divided. The original $a \times b \times c$ code was thought to be a $4 \times 3 \times 2$ code.

aberration. *See* chromosomal aberration.

abetalipoproteinemia. A genetically inherited metabolic defect in man that is characterized by either a decrease in, or a complete absence of, low-density lipoproteins.

abiogenesis. 1. The formation of a substance other than by a living organism. 2. The doctrine that living organisms can come from nonliving matter; spontaneous generation.

abiogenetic. Of, or pertaining to, abiogenesis.

abiogenic. Of, or pertaining to, abiogenesis (1).

abiological. Of, or pertaining to, nonliving matter.

abiosis. The absence of life.

abiotic. Of, or pertaining to, abiosis.

abnormal hemoglobin. A hemoglobin that differs from normal hemoglobin in its amino acid sequence.

ABO blood group system. A human blood group system in which there are two antigens, denoted A and B, that give rise to four serum groups, denoted A, B, AB, and O. The antigens are mucopeptides and contain a mucopolysaccharide that is identical in both antigens except for its nonreducing end. The serum groups A, B, AB, and O are characterized, respectively, by having red blood cells that carry A antigens, B antigens, both A and B antigens, and neither A nor B antigens.

abortive infection. A viral infection that either does not lead to the formation of viral particles or leads to the formation of noninfectious viral particles.

abortive transduction. Bacterial transduction in which the DNA from the donor cell is introduced into the recipient cell, but fails to become integrated into the chromosome of the recipient bacterium.

abrin. A plant protein in the seeds of *Abrus precatorius* that is toxic to animals and man, inhibits protein synthesis, and has antitumor activity.

abscissa. The horizontal axis, or x-axis, in a plane rectangular coordinate system.

absolute configuration. The actual spatial arrangement of the atoms about the asymmetric carbon atoms in a molecule.

absolute counting. The counting of radiation that includes every disintegration that occurs in the sample; such counts are expressed as disintegrations per minute.

absolute deviation. The numerical difference between an experimental value and either the true, or the best, value of the quantity being measured.

absolute plating efficiency. The percentage of cells that give rise to colonies when a given number of cells is plated on a nutrient medium.

absolute reaction rates. *See* theory of absolute reaction rates.

absolute specificity. The extreme selectivity of an enzyme that allows it to catalyze only the reaction with a single substrate in the case of a monomolecular reaction, or the reaction with a single pair of substrates in the case of a bimolecular reaction. *Aka* absolute group specificity.

absolute temperature scale. A temperature scale on which the zero point is the absolute zero, and the degrees, denoted °*T* or °*K*, match those of the centigrade scale. *Aka* Kelvin temperature scale.

absolute zero. The zero point on the absolute temperature scale; −273.2°C.

absorb. To engage in the process of absorption.

absorbance. A measure of the light absorbed by a solution that is equal to $\log I_0/I$, where I_0 is the intensity of the incident light, and I is the intensity of the transmitted light. *Sym* A. *Aka* optical density.

absorbance index. ABSORPTIVITY.

absorbance unit. The amount of absorbing material contained in 1 ml of a solution that has an absorbance of 1.0 when measured with an optical path length of 1.0 cm.

absorbancy. Variant spelling of absorbance.

absorbate. The substance that is absorbed by another substance.

absorbed antiserum. An antiserum from which antibodies have been removed by the addition of soluble antigens.

absorbed dose. *See* radiation absorbed dose.

absorbent. 1. *n* The substance that absorbs another substance. 2. *adj* Having the capacity to absorb.

absorber. A material used to absorb radioactive radiation.

absorptiometer. 1. An instrument for measuring the amount of gas absorbed by a liquid. 2. A device for measuring the thickness of a layer of liquid between parallel glass plates. 3. COLORIMETER.

absorption. 1. The uptake of one substance by another substance. 2. The passage of materials across a biological membrane. 3. The process by which all or part of the energy of incident radiation (includes heat, electromagnetic, and radioactive radiation) is transferred to the matter through which it passes. 4. The removal of antibodies from a mixture by the addition of soluble antigens, or the removal of soluble antigens from a mixture by the addition of antibodies.

absorption band. A portion of the electromagnetic spectrum in which a molecule absorbs radiant energy.

absorption cell. CUVETTE.

absorption coefficient. 1. ABSORPTIVITY. 2. BUNSEN ABSORPTION COEFFICIENT. 3. The rate of change in the intensity of a beam of radiation as it passes through matter.

absorption cross-section. The product of the probability that a photon passing through a molecule will be absorbed by that molecule and the average cross-sectional area of the molecule; the absorption cross-section s is related to the molar absorptivity ϵ by $s = 3.8 \times 10^{-21} \epsilon$.

absorption optical system. An optical system that focuses ultraviolet light passing through a solution in such a fashion that a photograph is obtained in which the darkening of the photographic film depends on the amount of light transmitted by the solution. A boundary in the solution appears as a transition between a lighter and a darker region, and measurements are made on the film by means of a densitometer tracing. The optical system is used in the analytical ultracentrifuge.

absorption ratio. The ratio of the concentration of a compound in solution to its absorptivity.

absorption spectrum. A plot of the absorption of electromagnetic radiation by a molecule as a function of either the frequency or the wavelength of the radiation.

absorptive lipemia. The transient lipemia that follows the ingestion of fat.

absorptivity. The proportionality constant ϵ in Beer's law, $A = \epsilon lc$, where A is the absorbance, l is the length of the light path, and c is the concentration.

abstraction. The removal of either an atom or an electron from a compound.

Ac. Acetyl group.

acanthocytosis. 1. A condition characterized by blood that contains spherical erythrocytes which have numerous projecting spines. 2. ABETALIPOPROTEINEMIA.

acatalasia. A genetically inherited metabolic defect in man that is due to a deficiency of the enzyme catalase.

acceleration. A stage in carcinogenesis in which, according to the Busch theory, an accelerator protein is synthesized which functions in accelerating the production of cancer RNA from cancer DNA.

accelerator. An instrument for imparting high kinetic energy to subatomic particles by means of electric and magnetic fields.

accelerator globulin. PROACCELERIN.

accelerator protein. *See* acceleration.

accelerin. The activated form of proaccelerin that converts prothrombin to thrombin during blood clotting.

acceptor control. The dependence of the respiratory rate of mitochondria on the ADP concentration. *See also* loose coupling; tight coupling.

acceptor-control ratio. The rate of respiration, in terms of oxygen uptake per unit time, in the presence of ADP, divided by the rate in the absence of ADP; measured either in the intact cell or in isolated mitochondria.

acceptor RNA. TRANSFER RNA.

acceptor site. AMINOACYL SITE.

accessory pigment. A photosynthetic pigment, such as a carotenoid or a phycobilin, that functions in conjunction with a primary photosynthetic pigment.

AcCoA. Acetyl coenzyme A.

accumulation theory. A theory of aging according to which aging is due to the accumulation of either a deleterious or a toxic substance.

accumulator organism. An organism capable of

absorbing and retaining large amounts of specific chemical elements.

accuracy. The nearness of an experimental value to either the true, or the best, value of the quantity being measured.

ACD solution. Acid–citrate–dextrose solution.

acellular. Not composed of cells.

ACES. *N*-(2-Acetamido)-2-aminoethanesulfonic acid; used for the preparation of buffers in the pH range of 6.0 to 7.5.

acetal. A compound derived from an aldehyde and two alcohol molecules by splitting out a molecule of water.

acetate hypothesis. The hypothesis that a multitude of complex substances may be formed naturally as a result of modifications of the linear chains formed by repeated head-to-tail condensation of acetic acid residues; typical modifications are cyclization, oxidation, and alkylation.

acetate-replacing factor. LIPOIC ACID.

acetate thiokinase. A fatty acid thiokinase that catalyzes the activation of fatty acids having two or three carbon atoms to fatty acyl coenzyme A.

acetification. The spoilage of beverages, such as wine and beer, due to the aerobic oxidation of ethyl alcohol to acetic acid by microorganisms.

acetoacetic acid. A ketoacid that can be formed from acetyl coenzyme A and that is one of the ketone bodies.

acetogenin. A compound formed by the head-to-tail condensation of either acetic acid residues or derivatives of acetic acid residues.

acetoin. A compound that can be formed by air oxidation of butylene glycol in the course of butylene glycol fermentation.

acetoin fermentation. BUTYLENE GLYCOL FERMENTATION.

acetone. A ketone that can be formed from acetyl coenzyme A and that is one of the ketone bodies.

acetone body. KETONE BODY.

acetonemia. 1. The presence of excessive amounts of acetone in the blood. 2. The presence of excessive amounts of ketone bodies in the blood.

acetone powder. A preparation of one or more proteins that is produced by removal of acetone by vacuum filtration from an acetone extract of a tissue; used in the course of isolating and purifying an enzyme or other protein.

acetonuria. 1. The presence of excessive amounts of acetone in the urine. 2. The presence of excessive amounts of ketone bodies in the urine.

acetylation. An acylation reaction in which an acetyl radical CH_3CO— is introduced into an organic compound.

acetylcholine. The acetylated form of choline; the hydrolysis of acetylcholine to choline and acetic acid is catalyzed by acetylcholinesterase and is a key reaction in the transmission of the nerve impulse. *Abbr* ACh.

acetylcholinesterase. The enzyme that catalyzes the hydrolysis of acetylcholine to choline and acetic acid during the transmission of a nerve impulse. *Abbr* AChE. *Aka* true cholinesterase; choline esterase I; specific cholinesterase. *See also* cholinesterase.

acetyl CoA. Acetyl coenzyme A.

acetyl coenzyme A. The acetylated form of coenzyme A; a key intermediate in the citric acid cycle, in fatty acid oxidation, in fatty acid synthesis, and in other metabolic reactions. Variously abbreviated as acetyl-S-CoA, acetyl-CoA, CoASAc, AcSCoA, and AcCoA.

acetyl coenzyme A carboxylase. The enzyme that catalyzes the synthesis of malonyl coenzyme A from acetyl coenzyme A and carbon dioxide, and that contains biotin as a prosthetic group.

acetylene. 1. The hydrocarbon $CH{\equiv}CH$. 2. ALKYNE.

acetyl group. The acyl group of acetic acid; the radical CH_3CO—.

***N*-acetylmuramic acid.** A compound derived from acetic acid, glucosamine, and lactic acid that is a major building block of bacterial cell walls.

***N*-acetylneuraminic acid.** A compound derived from acetic acid, mannosamine, and pyruvic acid that is a major building block of animal cell coats. *Abbr* NANA; NAcneu.

acetyl number. A measure of the number of hydroxyl groups in a fat; equal to the number of milligrams of potassium hydroxide required to neutralize the acetic acid in 1 gram of acetylated fat. *Aka* acetyl value.

acetylornithine cycle. A cyclic set of reactions in bacteria and plants that constitutes a major pathway for the synthesis of ornithine from glutamic acid and *N*-acetylornithine.

acetyl-S-CoA. Acetyl coenzyme A.

***N*-acetyl serine.** The acetylated form of serine that is believed to function in the initiation of translation in mammalian systems, much as *N*-formylmethionine functions in the initiation of translation in bacterial systems.

acetyltransferase. An enzyme that catalyzes the transfer of an acetyl group from acetyl coenzyme A to another compound.

AcG. Accelerator globulin.

Ac globulin. Accelerator globulin.

ACh. Acetylcholine.

A chain. 1. The shorter of the two polypeptide chains of insulin, containing 21 amino acids and one intrachain disulfide bond. 2. The heavy chain (H chain) of the immunoglobulins.

AChE. Acetylcholinesterase.

achromic. Devoid of color.

achromic point. A stage in the hydrolysis of starch at which the addition of iodine fails to produce a blue color.

achromotrichia factor. *p*-AMINOBENZOIC ACID.

achromycin. *See* tetracycline.

acid. *See* Bronsted acid; Lewis acid.

acidaminuria. AMINOACIDURIA.

acid anhydride. A compound containing two acyl groups bound to an oxygen atom. The compound is referred to as either a simple or a mixed anhydride depending on whether the two acyl groups are identical or different. In biochemistry, both simple and mixed anhydrides frequently contain the phosphoryl group.

acid-base balance. The reactions and factors involved in maintaining a constant internal environment in the body with respect to the buffer systems and the pH of the various fluid compartments.

acid-base titration. A titration in which either acid or base is added to a solution, and the titration is followed by means of pH measurements or by means of indicators.

acid–citrate–dextrose solution. An aqueous solution of citric acid, sodium citrate, and dextrose, that is used as an anticoagulant in the collection and storage of blood.

acidemia. A condition characterized by an increase in the hydrogen-ion concentration of the blood.

acid-fast. Descriptive of the lipid-rich cell walls of some bacteria that resist decolorization by mineral acids after having been stained with basic aniline dyes.

acid hematin. A hematin formed from hemoglobin by treatment with acid below pH 3.

acidic. 1. Of, or pertaining to, an acid. 2. Of, or pertaining to, a solution having a pH less than 7.0.

acidic amino acid. An amino acid that has one amino and two carboxyl groups.

acidic dye. An anionic dye that binds to, and stains, positively charged macromolecules. *Aka* acidic stain.

acidification of urine. The process whereby the glomerular filtrate of the kidney that has an approximate pH of 7.4 is converted to urine that has a lower pH and may have a pH as low as 4.8.

acidimetry. 1. The chemical analysis of solutions by means of titrations, the end points of which are recognized by a change in the hydrogen-ion concentration. 2. A determination of the amount of an acid by titration against a standard alkaline solution.

acid number. The number of milligrams of potassium hydroxide required to neutralize the free fatty acids in 1 gram of fat. *Aka* acid value.

acidolysis. Hydrolysis by means of an acid.

acidophil. A cell that stains with an acidic dye.

acidosis. A deviation from the normal acid-base balance in the body that is due to a disturbance which, by itself and in the absence of compensatory mechanisms, would tend to lower the pH of the blood. The actual change in pH depends on whether and to what extent the disturbance is compensated for. The disturbances and the compensatory mechanisms are considered primarily with respect to their effect on the bicarbonate/carbonic acid ratio of blood plasma. *See also* metabolic acidosis; primary acidosis; etc.

acidotic. Of, or pertaining to, acidosis.

acid pH. A pH value below 7.0.

acid phosphatase. A phosphatase, the optimum pH of which is below 7.0.

aciduria. A condition characterized by the excretion of an excessively acidic urine.

***cis*-aconitic acid.** A tricarboxylic acid formed from citric acid in one of the reactions of the citric acid cycle.

ACP. Acyl carrier protein.

a-c polarography. Alternating-current polarography; a polarographic method in which a small alternating potential is superimposed on the normal, direct-current applied potential, and the a-c component of the resulting current is measured.

acquired antibody. An antibody produced by an immune reaction as distinct from one occurring naturally.

acquired hemolytic anemia. An autoimmune disease in which an individual forms antibodies to his own red blood cells.

acquired immunity. The immunity established in an animal organism during its lifetime.

acquired tolerance. The immunological tolerance produced in an animal organism by the injection of antigen into it; acquired tolerance persists only as long as the antigen remains in the organism.

acridine dye. A planar heterocyclic molecule used to stain DNA and RNA. Acridine dyes are basic dyes that become intercalated into the nucleic acid molecule; they are mutagenic, since their intercalation produces insertions or deletions.

acridine orange. An acridine dye that functions both as a fluorochrome for staining nucleic acids and as a mutagen, producing insertions or deletions.

acriflavin. An acridine dye.

acrolein test. A qualitative test for glycerol, based on the dehydration and oxidation of glycerol to acrolein by heating with potassium bisulfate.

acromegaly. A condition characterized by overgrowth of skeletal structures due to the excessive production of growth hormone.

acrylamide. *See* polyacrylamide gel.

AcSCoA. Acetyl coenzyme A.

ACTH. Adrenocorticotropic hormone.

actidione. CYCLOHEXIMIDE.

actin. A major protein component of the myofilaments of striated muscle and the principal constituent of the thin filaments.

actin filament. A thin filament of striated muscle that consists largely of actin and that is linked to thick filaments by means of cross-bridges which protrude from them; a myofilament.

actinin. A minor protein component of striated muscle, believed to be part of the thin filaments and to be concentrated in both the Z line and the I band. Two components, denoted α and β actinin, have been identified.

actinometer. A device for the determination of absorbed light by means of a photochemical reaction of known quantum yield.

actinometry. A method of chemical analysis by means of an actinometer.

Actinomycin D. An antibiotic, produced by *Streptomyces chrysomallus*, that inhibits the transcription of DNA to RNA by binding to DNA and that also has immunosuppressive activity. *Aka* actinomycin C1.

action potential. The membrane potential of a stimulated membrane, produced by the ion flux across the membrane when its permeability is changed upon stimulation.

action spectrum. A plot of a quantitative biological or chemical response as a function of the wavelength of the radiation producing the response; the death of bacteria, the occurrence of mutations, the occurrence of fluorescence, and photosynthetic efficiency are examples of responses.

activated alumina. Alumina that has been thoroughly dried.

activated complex. *See* theory of absolute reaction rates.

activated form. *See* active form.

activating enzyme. 1. FATTY ACID THIOKINASE. 2. AMINOACYL-tRNA SYNTHETASE.

activation. 1. The conversion of a compound to a more reactive form; the change of an amino acid to aminoacyl transfer RNA, the change of a fatty acid to fatty acyl coenzyme A, and the change of an inactive enzyme precursor to the active enzyme are some examples. 2. The increase in the extent, and/or the rate, of an enzymatic reaction. 3. The drying of chromatographic supports. 4. The first stage in the conversion of a spore to a vegetative cell; this stage can frequently be produced by heat or aging and is believed to involve damage to an outer layer of the spore.

activation analysis. A method for the qualitative and quantitative analysis of the chemical elements in a sample; based on identification and determination of the radionuclides formed when the sample is bombarded with neutrons or other particles.

activation energy. The difference in energy between that of the activated complex and that of the reactants; the energy that must be supplied to the reactants before they can undergo transformation to products.

activation stage. That part of the blood clotting process that consists of the formation of active thrombin.

activator. A metal ion that serves as a cofactor for an enzyme.

activator constant. The equilibrium constant for the reaction $EA \rightleftarrows E + A$, where E is an enzyme and A is an activator.

active acetaldehyde. An acetaldehyde molecule attached to thiamine pyrophosphate; α-hydroxyethyl thiamine pyrophosphate.

active acetate. ACETYL COENZYME A.

active acetyl. 1. ACETYL COENZYME A. 2. Acetyl lipoic acid.

active acyl. 1. An acyl coenzyme A. 2. An acyl lipoic acid.

active adenosyl. ADENOSINE-5′-TRIPHOSPHATE.

active adenylate. ADENOSINE-5′-TRIPHOSPHATE.

active aldehyde. An aldehyde molecule attached to thiamine pyrophosphate; α-hydroxyalkyl thiamine pyrophosphate.

active aldehyde theory. The theory according to which the nonenzymatic browning of foods is due to reactions involving very active aldehydes that are formed by the dehydration of sugars.

active amino acid. 1. AMINOACYL ADENYLATE. 2. AMINOACYL-tRNA. 3. A Schiff base of an amino acid as that formed in transamination.

active anaphylaxis. The anaphylactic reaction produced in an animal organism as a result of the injection of antigen.

active carbohydrate. 1. A UDP-sugar. 2. A GDP-sugar.

active carbon dioxide. CARBOXYBIOTIN.

active center. ACTIVE SITE.

active concentration. ACTIVE TRANSPORT.

active form. 1. That derivative of a metabolite that can serve as a high energy compound and/or as a compound that initiates a reaction or a series of reactions. 2. That form of a macromolecule that possesses biological activity.

active formaldehyde. ACTIVE FORMYL.

active formate. 1. ACTIVE FORMYL. 2. ACTIVE FORMIMINO.

active formimino. A formimino group $NH{=}CH{-}$ attached to tetrahydrofolic acid.

active formyl. A formyl group $O{=}CH{-}$ attached to tetrahydrofolic acid.

active fructose. FRUCTOSE-1,6-DIPHOSPHATE.

active glycolaldehyde. A glycolaldehyde group $CH_2OH{-}CO{-}$ attached to thiamine pyrophosphate; α,β-dihydroxyethyl thiamine pyrophosphate.

active hydroxyethyl. ACTIVE ACETALDEHYDE.

active hydroxymethyl. 5,10-Methylene tetrahydrofolic acid.

active immunity. The immunity acquired by an animal organism as a result of the injection of antigens into it.

active iodine. That form of iodine, possibly an iodinium ion I^+, which reacts with tyrosine to form iodotyrosines in the thyroid gland.

active mediated transport. An active transport that requires one or more transport agents.

active methionine. *S*-ADENOSYLMETHIONINE.

active methyl. 1. 5-Methyl-tetrahydrofolic acid. 2. *S*-ADENOSYLMETHIONINE.

active patch. ANTIBODY COMBINING SITE.

active phosphate. 1. ADENOSINE-5′-TRIPHOSPHATE. 2. GUANOSINE-5′-TRIPHOSPHATE.

active phospholipid. A cytidine-5′-diphosphate derivative of either a phospholipid or a component of phospholipids.

active pyrophosphate. ADENOSINE-5′-TRIPHOSPHATE.

active pyruvate. A pyruvic acid molecule attached to thiamine pyrophosphate.

active site. 1. That portion of the enzyme molecule that interacts with, and binds, the substrate, thereby forming an enzyme-substrate complex. 2. That portion of the antibody molecule that interacts with, and binds, the antigen, thereby forming an antigen-antibody complex.

active site-directed irreversible inhibitor. An artificially designed inhibitor for the irreversible inhibition of a given enzyme. The inhibitor is a trifunctional molecule that contains (a) a functional group that can bind to the active site of the enzyme, (b) a nonpolar fragment that can attach to a nonpolar region just outside the active site, and (c) a group, such as a sulfonyl chloride, that can alkylate a functional group of the enzyme just outside the nonpolar region. The first functional group serves to direct the inhibitor to the active site of the enzyme; the nonpolar fragment serves to align the inhibitor so that the alkylating group is brought into contact with a susceptible group on the enzyme; and the third functional group then leads to an alkylation reaction that results in the irreversible inhibition of the enzyme. *See also* affinity labeling.

active sulfate. 1. The compound 3′-phosphoadenosine-5′-phosphosulfate that serves as a sulfating agent in the esterification of sulfate with alcoholic and phenolic hydroxyl groups. 2. The compound adenosine-5′-phosphosulfate that serves as an intermediate in the synthesis of 3′-phosphoadenosine-5′-phosphosulfate and that can be reduced directly to sulfite in *Desulfovibrio desulfuricans*.

active translocation. ACTIVE TRANSPORT.

active transport. The movement of a solute across a biological membrane such that the movement is directed upward in a concentration gradient (i.e., against the gradient) and requires the expenditure of energy.

activity. 1. A measure of the effective concentration of an enzyme, drug, hormone, or other substance, and by extension, the substance the effectiveness of which is being measured. 2. The product of the molar concentration of an ionic solute and its activity coefficient; activities must be used in place of molar concentrations for nonideal solutions.

activity coefficient. The ratio of the activity of an ion to its molar concentration; the logarithm of the activity coefficient is equal to $-0.5Z^2\sqrt{\Gamma/2}$, where Z is the charge of the ion and $\Gamma/2$ is the ionic strength. *See also* mean activity coefficient.

actomyosin. The complex formed between myosin and actin, either as extracted from muscle or as prepared from the purified components.

acute porphyria. A porphyria that is of short duration and that is characterized by the excretion of excessive amounts of uroporphyrin III, coproporphyrin III, and porphobilinogen.

acute serum. A serum obtained soon after the onset of a disease.

acute test. A toxicity test that is performed on laboratory animals and that requires only a single dose of a chemical, administered in a single application.

acyclic. ALIPHATIC.

acylation. The introduction of an acyl radical $RCO{-}$ into an organic compound.

acyl-carrier protein. A low-molecular weight protein that constitutes part of the fatty acid synthetase complex and that serves as a carrier of acyl groups during fatty acid biosynthesis. The acyl group is joined as a thioester to the sulfhydryl group of 4′-phosphopantetheine which, in turn, is esterified to a serine residue of the acyl carrier protein. *Abbr* ACP.

acyl enzyme. A postulated intermediate in the reaction catalyzed by the enzyme glyceraldehyde-3-phosphate dehydrogenase in which both NAD^+ and the acyl form of glyceraldehyde-3-phosphate are bound to the enzyme.

acylglycerol. A glyceride; mono-, di-, and triacylglycerols are referred to, respectively, as mono-, di-, and triglycerides.

acyl group. The radical *RCO*— that is derived from an organic acid by removal of the *OH* from the carboxyl group.

acyl-S-CoA. Acyl coenzyme A.

acyltransferase. An enzyme that catalyzes the transfer of an acyl group from acyl coenzyme A to another compound.

ADA. *N*-(2-Acetamido)-iminodiacetic acid; used for the preparation of buffers in the pH range of 5.8 to 7.4.

Adair equation. An equation used for calculating the average number of bound ligand molecules per molecule of total protein from binding data; the protein may have *n* binding sites with, or without, interaction between the sites.

Adamkiewicz reaction. The production of a violet color upon treatment of a solution containing protein with acetic acid and sulfuric acid.

Adam's catalyst. Platinum oxide, a catalyst for hydrogenation reactions.

adapter hypothesis. The hypothesis, suggested by Crick in 1958, that an amino acid is joined to a specific adapter molecule during protein synthesis. The adapter serves to carry the amino acid to the ribosome and becomes bound to the codon of the amino acid in the messenger RNA which is attached to the ribosome. In this fashion the adapter, now known to be transfer RNA, assures the insertion of the amino acid into its proper place in the growing polypeptide chain.

adapter RNA. TRANSFER RNA.

adaptive enzyme. INDUCIBLE ENZYME.

adaptor RNA. Variant spelling of adapter RNA.

Addison's disease. The pathological condition resulting from adrenal insufficiency.

addition polymer. A polymer formed by the addition of monomers to the growing chain through the breaking of double bonds in the monomers.

addition reaction. A chemical reaction in which there is an increase in the number of groups attached to carbon atoms so that the molecule becomes more saturated.

adduct. The product formed by the chemical addition of one substance to another.

adductor muscle. CATCH MUSCLE.

adenine. The purine 6-aminopurine that occurs in both RNA and DNA. *Abbr* A.

adenine nucleotide barrier. ATRACTYLOSIDE BARRIER.

adenohypophyseal. Of, or pertaining to, the anterior lobe of the pituitary gland.

adenohypophysis. The anterior lobe of the pituitary gland which produces the adrenocorticotropic. gonadotropic, lipotropic, somatotropic, and thyrotropic hormones.

adenoma. A tumor of epithelial tissue that is generally benign and in which the cells form glands or glandlike structures.

adenosine. The ribonucleoside of adenine. Adenosine mono-, di-, and triphosphate are abbreviated, respectively, as AMP, ADP, and ATP. The abbreviations refer to the 5′-nucleoside phosphates unless otherwise indicated. *Abbr* Ado; A.

adenosine-3′,5′-cyclic monophosphate. A cyclic nucleotide, commonly called cyclic AMP, that is formed from ATP in a reaction catalyzed by the enzyme adenyl cyclase. Cyclic AMP functions as a second messenger and mediates the effect of a large number of hormones. The hormones interact with the adenyl cyclase system in the cell membrane, and the intracellular cyclic AMP then interacts with specific enzymes or other intracellular components. *Abbr* cAMP. *Aka* cyclic adenylic acid.

adenosine diphosphate. The high-energy compound, adenosine-5′-diphosphate, that can undergo hydrolysis to adenosine-5′-monophosphate and inorganic phosphate. *Abbr* ADP.

adenosine monophosphate. The nucleotide, adenosine-5′-monophosphate, that can be formed by hydrolysis of either of the high-energy compounds, ATP or ADP. *Abbr* AMP.

adenosine-5′-phosphosulfate. *See* active sulfate (2).

adenosine triphosphatase. An enzyme, or a group of enzymes, that catalyzes the hydrolysis of ATP to either ADP and inorganic phosphate or to AMP and pyrophosphate. The enzyme is widely distributed in biological membranes and is implicated in the active transport of sodium and potassium ions. *Abbr* ATPase. *See also* Na,K-ATPase.

adenosine triphosphate. The high-energy compound, adenosine-5′-triphosphate, that functions in many biochemical systems. It can be hydrolyzed to either adenosine-5′-monophosphate or adenosine-5′-diphosphate; the hydrolysis reaction is accompanied by the release of a large amount of free energy which is used to drive a variety of metabolic reactions. *Abbr* ATP.

***S*-Adenosylmethionine.** A high-energy compound that is derived from ATP and methionine and that functions as a biological methylating agent. *Abbr* SAM.

adenovirus. A naked, icosahedral virus that

contins double-stranded DNA. Adenoviruses infect mammals, often leading to respiratory infections; some are oncogenic.

adenovirus-associated virus. A small, naked, icosahedral virus that contains single-stranded DNA and that is found in association with adenoviruses.

adenylate. A compound consisting of adenylic acid that is esterified through its phosphate group to another molecule.

adenylate control hypothesis. The hypothesis that cellular metabolism is regulated by the relative amounts of AMP, ADP, and ATP in the cell. *See also* energy charge.

adenylate cyclase. *See* adenyl cyclase.

adenylate kinase. MYOKINASE.

adenylate pool. The total intracellular concentration of AMP, ADP, and ATP.

adenyl cyclase. The enzyme that catalyzes the formation of cyclic AMP from ATP by the splitting out of pyrophosphate.

adenylic acid. The ribonucleotide of adenine.

ADH. 1. ALCOHOL DEHYDROGENASE. 2. ANTIDIURETIC HORMONE.

adiabatic process. A process conducted without either a gain or a loss of heat; a process conducted in an isolated system.

adiabatic system. A thermodynamic system that is thermally insulated from its surroundings.

adipocyte. A fat cell; a cell of adipose tissue.

adipokinetic hormone. LIPOTROPIN.

adipose tissue. Lipid tissue; fat deposits in an organism.

adiposis. A condition characterized by excessive accumulation of fat in the body; the accumulation may be local or general.

adiposity. OBESITY.

adjuvant. A substance that increases the immune response of an animal to an antigen when injected together with the antigen.

adjuvanticity. The capacity of a substance to function as an adjuvant.

ad libitum. Referring to the feeding of experimental animals where the animals are allowed to eat without any imposed restrictions. *Abbr* ad lib.

admix. To mix one substance with another.

admixture. 1. A mixture. 2. The act of mixing.

Ado. Adenosine.

adoptive immunity. The immunity acquired by an animal organism when it is injected with lymphocytes from another organism.

adoptive tolerance. The immunological tolerance acquired by an animal organism when it is injected with lymphocytes from another organism.

ADP. 1. ADENOSINE DIPHOSPHATE. 2. Adenosine-5′-diphosphate.

ADPG. ADP-glucose.

ADP-glucose. A nucleoside diphosphate sugar that is the donor of a glucose residue in the biosynthesis of starch in plants and in the biosynthesis of $\alpha(1 \rightarrow 4)$ glucans in bacteria. *Abbr* ADPG.

ADR. Adrenaline.

adrenal cortex. That part of the adrenal gland, derived from mesodermal tissue, which secretes the adrenal cortical hormones.

adrenal cortical hormone. A steroid hormone secreted by the adrenal cortex. Major adrenal cortical hormones are the glucocorticoids, cortisol and corticosterone, and the mineralocorticoid, aldosterone; minor adrenal cortical hormones are the sex hormones.

adrenal cortical steroid. A steroid produced by the adrenal cortex. Many of these steroids are hormones, such as the glucocorticoids, mineralocorticoids, and sex hormones; some, such as cholesterol, are not hormones.

adrenalectomy. The surgical removal of an adrenal gland.

adrenal gland. The endocrine gland located near the kidney and composed of two parts, a medulla that secretes epinephrine and norepinephrine, and a cortex that secretes the adrenal cortical hormones.

adrenaline. EPINEPHRINE.

adrenaline tolerance test. A test used in the diagnosis of glycogen storage disease type I; the test is based on measuring the level of blood glucose as a function of time following the injection of an individual with adrenaline.

adrenalism. A condition resulting from insufficient function of the adrenal glands.

adrenal medulla. That part of the adrenal gland, derived from ectodermal tissue, which secretes the hormones epinephrine and norepinephrine.

adrenal virilism. The appearance of male secondary sexual characteristics in a female as a result of excessive secretion of androgens by the adrenal cortex.

adrenergic. Of, or pertaining to, nerve fibers that release norepinephrine at the nerve endings.

adrenocortical steroid. CORTICOSTEROID.

adrenocorticotrophin. Variant spelling of adrenocorticotropin.

adrenocorticotropic hormone. A polypeptide hormone of 39 amino acids that stimulates the synthesis and secretion of adrenal cortical hormones by the adrenal cortex. The adrenocorticotropic hormone is secreted by the anterior lobe of the pituitary gland. *Var sp* adrenocorticotrophic hormone. *Abbr* ACTH.

adrenocorticotropin. ADRENOCORTICOTROPIC HORMONE.

adrenodoxin. A nonheme iron protein that functions as an electron carrier in microsomal, nonphosphorylating electron transport systems.

adrenosterone. An androgen produced by the adrenal gland.

adsorb. To attract and hold a substance to the surface of another substance.

adsorbate. A substance that is adsorbed to the surface of another substance from either a solution or a gas phase.

adsorbed antiserum. An antiserum from which antibodies have been removed by the addition of particulate antigens.

adsorbent. 1. *n* A substance that adsorbs another substance from either a solution or a gas phase. 2. *adj* Having the capacity to adsorb.

adsorption. 1. The adhesion of molecules to surfaces of solids. 2. The removal of antibodies from a mixture by the addition of particulate antigens, or the removal of particulate antigens from a mixture by the addition of antibodies. 3. The attachment of phage particles to a bacterial cell.

adsorption chromatography. A chromatographic technique in which molecules are separated on the basis of their adsorption properties. The stationary phase is a solid adsorbent, generally in the form of a column; the mobile phase is either an aqueous or an organic solution. The rate of movement of the molecules through the column depends on the degree of their adsorption to the solid adsorbent.

adsorption coefficient. A constant, under defined conditions, that relates the elution of a substance from a chromatographic column to the weight of adsorbent.

adult hemoglobin. The major form of hemoglobin in normal adults that is designated HbA; a minor form is designated HbA_2.

AE-cellulose. Aminoethyl-cellulose, an anion exchanger.

aerial mycelium. That portion of a fungal mycelium that projects above the surface of the medium and frequently bears either reproductive cells or spores.

aerobe. *See* facultative aerobe; obligate aerobe.

aerobic. 1. In the presence of oxygen; in an environment or an atmosphere containing oxygen. 2. Requiring the presence of molecular oxygen for growth. 3. Capable of using molecular oxygen for growth. *See also* oxybiontic.

aerobic glycolysis. The group of cellular reactions whereby glucose is converted to pyruvic acid.

aerobic respiration. RESPIRATION (3).

aerobiosis. Life under aerobic conditions.

aerobiotic. Of, or pertaining to, aerobiosis.

aerogel. A rigid gel that has maintained its original structure despite the loss of solvent.

aerosporin. POLYMYXIN.

aerotaxis. A taxis in which the stimulus is air; used particularly for the taxis of bacteria in response to oxygen.

afferent inhibition. The prevention of transplantation immunity through the binding of antibodies from the recipient animal to antigens in the transplant; as a result, the transplant antigens are unable to reach and/or to stimulate the antibody-forming cells in the recipient animal.

affinity. 1. The capacity of an enzyme to bind substrate; generally measured by the affinity constant. 2. The capacity of an antibody to bind either antigens or haptens; frequently measured by the average intrinsic association constant for the binding reaction.

affinity chromatography. A column chromatographic technique in which desired molecules are separated from a mixture of molecules by using a modified chromatographic support that is either biochemically or immunochemically specific for the molecules of interest. Biochemically or immunochemically reactive molecules are linked covalently to a support without destroying the activity and the specificity of the molecules. These covalently linked molecules will then bind specifically the molecules of interest when a mixture of molecules is passed through the column. Two examples are the use of DNA-cellulose for the isolation of DNA-dependent DNA polymerase, and the use of agarose-antibody preparations for the isolation of antigens.

affinity constant. The reciprocal of the dissociation constant for the complex PL in the reversible system $P + L \rightleftarrows PL$, where P is usually a protein and L is a ligand such as a substrate, an inhibitor, or an activator. *See* also association constant.

affinity elution. A chromatographic technique in which compounds are adsorbed nonspecifically to a column and the compound of interest is then eluted specifically through its binding to a ligand in the eluting solvent.

affinity labeling. A method for the specific labeling of the active site of an enzyme, antibody, or other protein. A reagent A-X that can bind specifically, reversibly, and noncovalently to the active site through its A group is first allowed to bind to the active site. The reagent is then linked covalently through its chemically reactive group X to an amino acid at or close to the active site. *See also* active site-directed irreversible inhibitor.

affinity ratio. The ratio of the substrate constant for one reaction to the substrate constant for a second reaction that is catalyzed by the same enzyme but involves a different substrate.

afibrinogenemia. A genetically inherited metabolic defect in man that is characterized either by the complete absence of fibrinogen or by the presence of a defective fibrinogen.

aflatoxin. A toxic and carcinogenic compound produced by fungi.

AFP. Alpha-fetoprotein.

Ag. 1. Antigen. 2. Silver.

agammaglobulinemia. A genetically inherited metabolic defect in man that is characterized by the complete absence of immunoglobulins. *See also* hypogammaglobulinemia.

agar. An acidic polysaccharide extracted from certain seaweeds; used as a solidifying agent of culture media in microbiology and as a support medium for zone electrophoresis.

agar diffusion method. A method for determining the sensitivity of a microorganism to an antimicrobial drug; based on measuring the zone of growth inhibition when the drug is placed in a cylinder, a hole, or a filter paper disk on a petri plate that has been seeded with the microorganism.

agar gel electrophoresis. Zone electrophoresis in which the supporting medium consists of a gel prepared from agar.

agarose. A sulfate-free, neutral fraction of agar used in gel filtration.

agar plate count. A plate count in which the solid nutrient medium contains agar.

age. The length of time that a preparation of cells or a subcellular fraction has been stored.

age pigment. An insoluble granule that accumulates in certain tissues upon aging.

agglutinating antibody. AGGLUTININ.

agglutination. The clumping of bacterial and other cells that is brought about by an antigen-antibody reaction between the particulate antigens on the cell surface and added antibodies.

agglutinin. An antibody that can bind to particulate antigens on the surface of cells to produce an agglutination reaction.

agglutinogen. A surface antigen of bacterial and other cells that can induce the formation of agglutinins and can bind to them to produce an agglutination reaction.

aggregate anaphylaxis. An anaphylactic shock that is produced by a single injection of antigen.

aggressin. A substance that is produced by a microorganism and that, though not necessarily toxic by itself, promotes the invasiveness of the microorganism in the host; the enzymes hyaluronidase and collagenase are two examples.

aglucone. The noncarbohydrate portion of a glucoside.

aglycone. The noncarbohydrate portion of a glycoside.

agonist. A molecule, such as a drug, an enzyme activator, or a hormone, that enhances the activity of another molecule.

A/G ratio. Albumin/globulin ratio.

AHF. Antihemophilic factor.

AHG. 1. Antihemophilic globulin. 2. Antihuman globulin.

AICAR. 5-Aminoimidazole-4-carboxamide ribonucleotide; an intermediate in the biosynthesis of purines.

AICF. Autoimmune complement fixation.

air dose. The dose of radiation delivered to a specified point in air.

air peak. The gas chromatographic peak that is produced when a small amount of air is injected with the sample into the chromatographic column.

Akabori hypothesis. The hypothesis that the origin of proteins is based on the polymerization of nonamino acid building blocks to form polyglycine and on the subsequent replacement of the alpha hydrogens in polyglycine by various *R* groups in secondary reactions.

Akabori reaction. The formation of an alkamine by the reaction of an aldehyde with the amino group of an amino acid.

Al. Aluminum.

Ala. 1. Alanine. 2. Alanyl.

alanine. An aliphatic nonpolar amino acid; α-alanine occurs in proteins and β-alanine occurs in the peptides anserine and carnosine. *Abbr* Ala; A.

alarm reaction. GENERAL ADAPTATION SYNDROME.

albinism. A genetically inherited metabolic defect in man that is characterized by the lack of skin pigmentation and that is due to a deficiency of the enzyme tyrosinase.

albino. A person or an animal that is deficient in skin pigmentation.

albumin. A water-soluble, globular, and simple protein that is not precipitated by ammonium sulfate at 50% saturation.

albumin/globulin ratio. The ratio of the concentration of serum albumin to that of serum globulin. *Abbr* A/G ratio.

albuminimeter. An apparatus for determining protein in biological fluids on the basis of the volume of the precipitated protein.

albuminuria. The presence of excessive amounts of protein, mainly albumin, in the urine.

Albustix test. A rapid, semiquantitative test for protein in urine by means of paper strips impregnated with buffer and indicator. *See also* protein error.

alcohol. 1. An alkyl compound containing a hydroxyl group. The alcohol is designated as a primary, a secondary, or a tertiary alcohol depending on whether the hydroxyl group is attached to a carbon atom that is linked to one, two, or three other carbon atoms. 2. Ethyl alcohol; ethanol.

alcohol dehydrogenase. A pyridine-linked dehydrogenase that catalyzes the reduction of acetaldehyde to ethanol.

alcoholic fermentation. The group of reactions, characteristic of yeast, whereby glucose is fermented to ethyl alcohol.

alcoholic hydroxyl group. A hydroxyl group attached to an aliphatic carbon chain.

alcoholic steroid. STEROL.

alcoholysis. The cleavage of a covalent bond of an acid derivative by reaction with an alcohol *ROH* so that one of the products combines with the *H* of the alcohol and the other product combines with the *OR* group of the alcohol.

aldaric acid. A dicarboxylic sugar acid of an aldose in which both the aldehyde group and the primary alcohol group have been oxidized to carboxyl groups.

aldehyde. An organic compound that contains an aldehyde group.

aldehyde group. The carbonyl group attached to one carbon and one hydrogen atom; the grouping *—CHO*.

aldehyde indicator. SCHIFF'S REAGENT.

aldimine. An organic compound of the general formula *R—CH═NH*.

alditol. GLYCITOL.

aldo-. 1. Combining form meaning aldose. 2. Combining form meaning aldehyde.

aldofuranose. An aldose in furanose form.

aldolase. 1. An aldehyde-lyase. 2. The enzyme of glycolysis that catalyzes the interconversion of fructose-1,6-diphosphate to dihydroxyacetone phosphate and glyceraldehyde-3-phosphate.

aldol condensation. An addition reaction of two ketones, or two aldehydes, or an aldehyde and a ketone.

aldonic acid. A monocarboxylic sugar acid of an aldose in which the aldehyde group has been oxidized to a carboxyl group.

aldopyranose. An aldose in pyranose form.

aldose. A monosaccharide, or its derivative, that has an aldehyde group.

aldosterone. The major mineralocorticoid in man.

aldosteronism. A pathological condition characterized by the excessive production and secretion of aldosterone.

alexin. COMPLEMENT.

ALG. Antilymphocyte globulin.

alga (*pl* algae). A chlorophyll-containing, photosynthetic protist; algae are unicellular or multicellular, are generally aquatic, and are either eucaryotic or procaryotic.

algal. Of, or pertaining to, algae.

alginic acid. An algal polysaccharide of mannuronic acid.

algorithm. 1. A computational method or a set of rules for obtaining the solution of all problems of a specified type in a finite number of operations; a fixed sequence of formulas and/or algebraic and/or logical steps for calculations of a given problem. 2. A defined process consisting of a number of fixed step-by-step procedures for accomplishing a given result in a finite number of steps. *See also* heuristic process; stochastic process.

alicyclic. Designating a compound derived from a saturated cyclic hydrocarbon.

ali-esterase. CARBOXYLESTERASE.

alimentary. 1. Of, or pertaining to, food or nutrition. 2. Nutritious.

alimentary canal. DIGESTIVE TRACT.

alimentary glycosuria. The temporary increase in the level of glucose in the urine that follows a meal rich in carbohydrates.

aliphatic. Of, or pertaining to, an organic compound that has an open chain structure. *Aka* acyclic.

aliquot. 1. A part of a whole that divides the whole without a remainder; thus 4 ml, but not 7 ml, is an aliquot of 12 ml. 2. Any part or fraction of a whole.

alkalemia. A condition characterized by a decrease in the hydrogen-ion concentration of the blood.

alkali. A base, specifically one of an alkali metal.

alkali disease. One of a number of animal poisonings of either plant or mineral origin.

alkali metal. An element of group *IA* in the periodic table that consists of the elements lithium *Li*, sodium *Na*, potassium *K*, rubidium *Rb*, cesium *Cs*, and francium *Fr*.

alkalimetry. 1. The chemical analysis of solutions by means of titrations, the end points of which are recognized by a change in the hydrogen-ion concentration. 2. A determination of the amount of a base by titration against a standard acid solution.

alkaline. BASIC.

alkaline earth. An element of group *IIA* in the periodic table that consists of the elements beryllium *Be*, magnesium *Mg*, calcium *Ca*, strontium *Sr*, barium *Ba*, and radium *Ra*.

alkaline hematin. A hematin formed from hemoglobin by treatment with alkali above pH 11.

alkaline pH. A pH value above 7.0.

alkaline phosphatase. A phosphatase, the optimum pH of which is above 7.0.

alkaline reserve. The plasma bicarbonate concentration that is determined either from the carbon dioxide combining power of plasma or from the direct titration of plasma. *Aka* alkali reserve.

alkaline rigor. The increase in pH upon death that occurs in some species of fish where death was preceded by struggling.

alkaline tide. The increase in the pH of the blood and of the urine that occurs shortly after a meal; thought to be due to the withdrawal of