

# Y

**Y** 1. Pyrimidine nucleoside. 2. Tyrosine. 3. Yttrium.

**Y base** A highly modified guanine residue in tRNA that exhibits a characteristic fluorescence.

**Y cell** See XYZ cell theory.

**Y chromosome** A sex chromosome that is generally the mate of the X chromosome in the male.

**yeast** A lower fungus that reproduces by budding and that is characterized by either short or nonexistent mycelia; refers particularly to fungi of the genus *Saccharomyces*.

**yeast eluate factor** Obsolete designation of vitamin B<sub>6</sub>.

**yeast filtrate factor** Obsolete designation for pantothenic acid.

**yeast nucleic acid** An early designation for RNA.

**yellow enzyme** One of a group of flavoprotein dehydrogenases that contain a yellow flavin prosthetic group. See also old yellow enzyme.

**yellow protein reaction** XANTHOPROTEIC REACTION.

**Y fork** REPLICATING FORK.

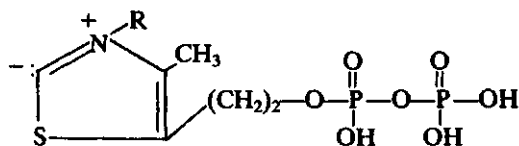
**yield** 1. For a general chemical reaction: the weight of product obtained divided by the theoretical yield of product. 2. For the isolation of an enzyme: the total activity at a given step in the isolation divided by the total activity at a reference step.

**yield coefficient** The weight of bacteria obtained from a culture divided by the weight of a limiting material that was utilized by the

bacteria during their growth. Aka yield constant.

**yin-yang hypothesis** The hypothesis that cyclic AMP (cAMP) and cyclic GMP (cGMP) are the opposing arms of a bidirectional intracellular control system. This is based on the finding that these two compounds often undergo inverse changes in concentration (one increase while the other decreases) in cellular events in which opposing or bidirectional processes are being regulated.

**ylide** A dipolar compound with adjacent positive and negative charges; a dipolar carbanion. The dipolar form of thiamine pyrophosphate is an example:



**yogurt** A fermented milk product, generally made by adding a culture of *Lactobacillus bulgaricus* to milk and incubating the mixture. Var *sp* yoghurt; yohourt.

**Young-Helmholtz trichromatic theory** The theory according to which color vision is due to a set of at least three pigments in the cones for the perception of red, green, and violet, respectively, and the perception of other colors results from the combined stimulation of two or more of these pigments.

**Yphantis method** MENISCUS DEPLETION SEDIMENTATION EQUILIBRIUM.

# Z

**Z** 1. Average net charge of an ion. 2. Atomic number. 3. The sum of glutamic acid and glutamine when the amide content is either unknown or unspecified. 4. Impedance.

**z-average molecular weight** An average molecular weight that is weighted toward the heavier molecules in a mixture of molecules; specifically,  $\bar{M}_z = \sum n_i M_i^3 / \sum n_i M_i^2$ , where  $n_i$  is the number of moles of component  $i$ , and  $M_i$  is the molecular weight of component  $i$ . *Sym*  $\bar{M}_z$ . *See also* average molecular weight.

**Z cell** *See* XYZ cell theory.

**Z DNA** *See* DNA forms.

**zeatin** A purine derivative that occurs free in maize and many other plants; a naturally occurring cytokinin. *Aka* maize factor.

**Zeeman effect** The splitting of the degeneracies of the excited states of a chromophore by an external magnetic field.

**zein** A seed protein of corn.

**zeolite** A naturally occurring alkali metal- or alkaline earth-aluminum silicate that has a network structure and ion-exchange capacity; used as an ion exchange resin for water softening and as a molecular sieve. *See also* permutite.

**zero layer line** EQUATOR.

**zero meniscus concentration method** MENISCUS DEPLETION SEDIMENTATION EQUILIBRIUM.

**zero mobility position** The position occupied by an uncharged substance in an electrophoresis experiment.

**zero-order kinetics** The kinetics of a zero-order reaction.

**zero-order reaction** A chemical reaction in which the velocity of the reaction is independent of the concentrations of the reactants.

**zero point** The point on an x-ray diffraction pattern where the incident beam strikes the photographic film.

**zero-point mutation** A mutation that is expressed immediately following the irradiation of cells with a mutagenic radiation.

**zersth law of thermodynamics** The law that establishes a quantitative concept of temperature so that the state of every thermodynamic system includes temperature either explicitly or implicitly. The law can be phrased as follows: If body A is in temperature equilibrium with body C, and body B is in temperature equilibrium with body C, then bodies A and B are in temperature equilibrium with each

other. This principle is assumed whenever a thermometer is used to compare the temperature of two systems. *See also* thermodynamics.

**zero time binding DNA** That fraction of the DNA, in a reassociation kinetics experiment, that contains repeating sequences and, therefore, forms duplexes at the very start of the reaction.

**zero time control** A control used in enzyme studies in which the enzyme is inactivated prior to addition of, and incubation with, the substrate.

**zeta potential** The potential difference across the plane of motion between two phases, particularly the potential across the surface of shear between a charged particle and its surrounding ion atmosphere in electrophoresis. *See also* Stern potential.

**zeugmatography** SPIN-IMAGING.

**Z form** *See* DNA forms.

**zigzag scheme** Z-SCHEME.

**Zimm-Crothers viscometer** A Couette-type viscometer in which the inner cylinder is a self-centering float; used for viscosity studies of DNA.

**Zimmerman method** *See* electrofusion.

**Zimm plot** A double extrapolation used in the analysis of light scattering data when the scattering particles are larger than those involved in Rayleigh scattering. A plot of  $Kc/R_\theta$  versus  $\sin^2(\theta/2) + kc$  is extrapolated both to  $c = 0$  and to  $\theta = 0$ , where  $K$  is an optical constant,  $c$  is the concentration,  $R_\theta$  is the Rayleigh ratio,  $\theta$  is the angle at which scattering is observed, and  $k$  is an arbitrary constant chosen to provide a convenient spread of the data. Both the molecular weight and the radius of gyration can be obtained from the plot. *Aka* Zimm grid.

**zinc** An element that is essential to all plants and animals. Symbol, Zn; atomic number, 30; atomic weight, 65.37; oxidation state, +2; most abundant isotope,  $^{64}\text{Zn}$ ; a radioactive isotope,  $^{65}\text{Zn}$ , half-life, 243.7 days, radiation emitted, positrons and gamma rays.

**zinc finger** A structural domain in proteins, formed by folding of a polypeptide chain about a zinc atom. Such domains have been found in nucleic acid binding proteins and are believed to be involved in the binding of these proteins to the nucleic acid.

**zinc sulfate turbidity test** A liver function test

- that is based on the production of turbidity when serum from individuals with one of several forms of hepatitis is treated with a barbiturate buffer containing zinc sulfate.
- zippering** The rapid formation of a helical DNA or RNA duplex from the two separated and complementary strands; it follows a slower helix nucleation step in which a short stretch of double helix is formed. The reverse process, separation of the two strands, is known as unzipping (unzipping). *Aka* zip-ping; zippering up.
- Z line** The dark line that bisects the I band of the myofibrils of striated muscle.
- Zn** Zinc.
- Zollinger-Ellison syndrome** A clinical syndrome, characterized by excessive secretion of gastric juice, hyperplasia of gastric mucosa, and severe peptic ulcer disease; due to the presence of gastrin-producing tumors (gastrinomas).
- zonal centrifugation** DENSITY GRADIENT CENTRIFUGATION.
- zonal centrifuge** A specially designed centrifuge that allows large scale and continuous fractionation of material by density gradient centrifugation.
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- zonal diffusion** A method for determining diffusion coefficients from the diffusion profile that is produced by the diffusion of a thin layer of macromolecules which have been placed in a shallow density gradient in a zonal centrifuge rotor.
- zonal electrophoresis** ZONE ELECTROPHORESIS.
- zonal rotor** A high-capacity rotor used for zonal centrifugation in a preparative ultracentrifuge.
- zone centrifugation** DENSITY GRADIENT CENTRIFUGATION.
- zone convection electrofocusing** A technique for conducting horizontal isoelectric focusing in free solution rather than in a density gradient.
- zone electromigration** ZONE ELECTROPHORESIS.
- zone electrophoresis** An electrophoretic technique in which components are separated into zones or bands in a buffer that is generally stabilized by a solid, porous, supporting material such as filter paper, starch gel, agar gel, or polyacrylamide gel.
- zone precipitation** The precipitation of a protein as a zone in a gel filtration column that is brought about by using a gradient of a protein precipitating agent.
- zone spreading** The broadening of a zone in either chromatography or electrophoresis as a result of processes such as eddy diffusion and eddy migration.
- zoopherin** Obsolete designation for vitamin B<sub>12</sub>.
- zoosterol** A sterol that occurs in animals.
- zootoxin** ANIMAL TOXIN.
- Z scheme** The series formulation for the photosynthetic reactions of photosystems I and II of chloroplasts.
- ZTP** 5-Amino-4-imidazole carboxamide riboside 5'-triphosphate; a compound believed to function as an alarmone in response to shortages of folate coenzymes.
- zwischenferment** GLUCOSE-6-PHOSPHATE DEHYDROGENASE.
- zwitterion** DIPOLAR ION.
- zwitterion-pair chromatography** A form of ion-pair chromatography in which a zwitterion-pairing agent (hetacron; a zwitterionic compound that forms preferentially quadrupolar ion pairs with zwitterionic solutes) is added to the predominantly aqueous eluent in reversed phase liquid chromatography. The method is useful for the separation of bases, nucleosides, and nucleotides.
- zygospore** A spore formed by the conjugation of two other spores.
- zygote** 1. The cell produced by the union of the male and female gametes in reproduction. 2. The organism that develops from a zygotic cell.
- zygotic induction** The induction of a prophage that is transferred during conjugation from a lysogenic *Hfr* cell to a nonlysogenic *F*<sup>-</sup> cell.
- zymase** A heat-labile enzyme fraction that is obtained from yeast and that catalyzes the reactions of alcoholic fermentation.
- zymogen** The inactive precursor form of an enzyme that is generally converted to the active form by limited proteolysis.
- zymogen granule** A membrane-surrounded, cytoplasmic, secretory vesicle that is formed by the Golgi apparatus. Zymogen granules serve to store, and subsequently to secrete, the zymogens synthesized by the ribosomes of the endoplasmic reticulum.
- zymogram** The record of a zone electrophoresis experiment in which the enzymes in a sample, particularly esterases, are separated according to their charge and molecular dimensions, and in which the activity of these enzymes is indicated by specific staining reactions. A zymogram thus provides a measure of the types and the relative amounts of various enzymes in the sample; zymograms prepared from bacterial samples may be used as an aid in bacterial taxonomy.
- zymology** The science that deals with fermentations.
- zymolyase** An enzyme preparation from

*Arthrobacter luteus* that is useful for lysing yeast cells and producing spheroplasts.

**zymosan** A polysaccharide derived from yeast cells that inactivates complement.

**zymosis** FERMENTATION.

**zymosterol** An intermediate in the biosynthesis of cholesterol from lanosterol.

**zymurgy** The application of fermentation to the manufacture of alcoholic beverages.