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Physics Terminology

PHYSICS Terminology
The ABCs of Physics

A

absolute zero: Lowest possible temperature, 0 K (or -273°C)

AC: Abbreviation for alternating current in electric circuits

acceleration (a): Rate of change of velocity, $\Delta v/\Delta t$, where a is a vector with magnitude and direction

acceleration due to gravity (g): Used to calculate gravitational force or weight on Earth's surface, $F_g = mg$, where $g = 9.8 \text{ m/s}^2$

actinide: Any element with an atomic number of 90 or above, has a radioactive and unstable nucleus

adhesion: Attraction of unlike molecules or materials

adiabatic process: Process in which no heat flows between a system and its surroundings, $Q = 0$ and $\Delta E = -W$

alloy: Solution of two or more metals

alpha particle: Radioactive emission, identical to helium nucleus, charge = $+2$

amalgam: Alloy of mercury with another metal

ampere (A): SI unit of measurement for electric current, $1 \text{ A} = 1 \text{ C/s}$

Ampere's law: For a circular current path, magnetic flux must be consistent with the current

angular force: Force applied to a rotating body resulting in angular acceleration, defined as torque, $\tau = rF$

angular frequency of a wave (w): Frequency measurement given in rad/s , $\omega = 2\pi f$

angular momentum (L): Momentum associated with rotational motion

anion: Ion with a negative charge, formed by adding one or more electrons to an atom or molecule

anode: Electrode that supports oxidation

antimatter: Subatomic particles with properties complementary to the matter that forms our universe

Archimedes' principle: Objects immersed in water feel a buoyant force, $F_b = \rho V g$

atmosphere (atm): Unit of measurement of pressure

atom: Fundamental component of all matter, small, not part of an element

atomic mass number (A): Total number of protons and neutrons in the nucleus of an atom

atomic mass unit (amu): Measurement standard for mass on an atomic or molecular scale, $1/12$ the mass of a ^{12}C atom

atomic number (Z): Number of protons in the nucleus, defines the element

atomic weight: Weighted average of naturally occurring isotopes of an element

Avogadro's law: For constant pressure and temperature, gas volume is proportional to the number of moles of the gas

Avogadro's number: See mole

B

bar: Unit of pressure measurement, $1 \text{ bar} = 10^5 \text{ Pa}$

bar magnet: Field generated from the poles of the magnet, denoted North and South

barometer: Instrument that measures atmospheric pressure

batteries: Device that produces an electric current, a.k.a. galvanic cell

Bernoulli's equation: General description of fluid flow through a tube or pipe

beta particle: Radioactive emission; energetic electron ejected from the nucleus, charge = -1

big bang theory: Current model for the beginning of our cosmos

Right-Hand rule: Electric current induces a magnetic field around a conductor

blackbody: Ideal absorber and emitter of radiation

black hole: Superdense collapsed star, traps light and all matter

blue shift: Light from distant stars has a shorter wavelength due to the movement of the source of the light toward the Earth

body-centered cubic structure (BCC): Molecular structure with coordination number of 8, with one atom at the center of a cube of atoms

body force: Force that acts on the entire body, exerted at the center of mass

Bohr model: Theory that describes the structure of the hydrogen atom based on quantized angular momentum, predicts quantized energy levels

boiling point (T_b): Liquid-gas equilibrium at a pressure of 1 atm, for water, $T_b = 100^{\circ}\text{C}$

boson: One of two types of subatomic particles (i.e., the photon is a boson)

Boyle's law: For constant temperature, pressure is inversely proportional to volume

Brewster's law: Light becomes polarized by reflecting it from a surface at a precise angle

bulk modulus (B): Measures the volume stress on a body

C

caldoric scale: English unit of energy, used in dietary guidelines

capacitance (C): Ratio of charge, Q , divided by the voltage, V , for a capacitor, $C = Q/V$

capacitor: Charge storage device in which two separated electrical conducting plates hold equal and opposite charge; in circuits, certain groups of capacitors are found to behave like a single capacitor

parallel: $C_{\text{eq}} = \Sigma C_i$; series: $1/C_{\text{eq}} = \Sigma 1/C_i$

energy stored in a charged capacitor: $U = \frac{1}{2} q\Delta V = \frac{1}{2} q(V_+ - V_-) = \frac{1}{2} q\Delta V$

current cycle: One engine with isothermal and adiabatic steps, for the first step-cycle, $\Delta T = 0$, $\Delta E = 0$, and $\Delta S = 0$

Carnot engine thermal efficiency (e): Efficiency of an ideal heat engine: $e = 1 - T_c/T_h$

Carver's law: Describes heat capacities for an ideal gas, $C_p - C_v = R$, modified for molecular gases, where C_v is the heat capacity for constant volume (ΔE is the key thermodynamic variable) and C_p is the heat capacity for constant volume (ΔE is the key thermodynamic variable)

Cartesian coordinate system: Coordinate system that specifies each point uniquely in a plane by a pair of components, usually x and y

cation: Ion with a positive charge, formed by removing one or more electrons from an atom or molecule

Celsius ($^{\circ}\text{C}$): Temperature scale used for most routine experimental work; for some calculations, convert Celsius to Kelvin, $T(\text{K}) = T(^{\circ}\text{C}) + 273.15$

center of mass: Average position of a body, accounting for the object's mass distribution

centripetal acceleration: For circular motion, $a_c = v^2/r$, directed toward the rotational center

chain reaction: Propagation of a nuclear fission reaction in a fissionable material

Charles' law: For constant pressure, volume is proportional to temperature

circular motion: Movement of a body about a rotational axis at constant velocity

circular motion arc length: Length of a motion path along a circle (s), $s = r\theta$, where θ is in radians

classical mechanics: See Newtonian mechanics

closest packing: Most efficient packing of atomic spheres in a solid structure; See body-centered cubic structure, cubic close-packed structure, face-centered cubic structure

hexagonal close-packed structure, single cubic structure

cohesion: Attraction of like molecules or materials

combination of thin lenses: Finds a lens with the properties of the two combined lenses, focal length is denoted by $1/f = 1/f_1 + 1/f_2$

condensation: Conversion of a gas to a liquid

conductivity (w): Ratio of current density, J , to the electric field, E , $J = \sigma E$

conservative system: Systems in which no other forces are acting on the system, E is constant

constructive interference: Two waves overlap to produce a single wave with a larger amplitude than either of the two waves alone



Synopsis

Essential terminology for Physics study pulled together in one guide to maximize success in College and High School courses. Succinct definitions by our resident Harvard Ph.D., Chemistry author and professor ensure the usefulness of this handy guide from high school to college.

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Its hard to rate this because it is exactly as advertised but you always feel like you need a little more description. It has a lot of good information on there though. I use it to look back at for a quick review every couple months as I go through my upper level courses!

This was recommended for my college class but it honestly didn't help. Save your money and take notes

Very helpful

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