Absolute filter: A filter or filter medium of ultra-high collection efficiency for very small particles (sub-micrometer size) so that essentially all particles of interest or of concern are collected. Commonly, the efficiency is in the region of 99.95% or higher for a standard aerosol of 0.3 μm diameter [*].

Absolute humidity: The ratio of the mass of water vapor to the total volume of the moist air [17].

Absorption: (1) General: A process in which one material (the absorbent) takes up and retains another (the absorbate) with the formation of a homogeneous mixture having the attributes of a solution. Chemical reaction may accompany or follow absorption [18]. (2) Toxicology: The entrance of a toxic agent through the body surface (e.g., through eye or skin contact) [20].

Acceptable air quality: Air in which there are no known contaminants at harmful concentrations as determined by cognizant authorities and with which a substantial majority (80% or more) of the people exposed do not express dissatisfaction. [28].

Activated carbon: Carbon obtained from vegetable or animal matter by roasting in a vacuum furnace. Its porous nature gives it a very high surface area per unit mass - as much as 1000 square meters per gram. This material is a very good adsorbent for relatively high concentrations of aromatic and unsaturated aliphatic compounds. It is extensively used for odor control in air pollution and air-freshening applications, and adsorption of ozone from electrostatic machines such as photocopiers [from 13]. However, activated carbon has a limited capacity for removing low-concentration VOCs from air, and if technical grade activated carbon is used in an air-purifier, it can even be a source of VOCs for some time [*].

Acute exposure: Exposure by the oral, dermal, or inhalation route for 24 hours or less [9].

Acute health effect: An effect that occurs almost immediately (hours/days) after a single or brief/acute exposure to a toxic agent. Generally, acute effects will be evident within 14 days [from 7]. Having a short and relatively severe course on health effects, not chronic per se [20], though some may be of such magnitude as to produce a semi-permanent or permanent biological change. See also prolonged and chronic exposures and health effects.

Acute toxicity: Any poisonous effect produced within a short period of time following an exposure, usually 24 to 96 hours [9]. See also chronic toxicity.

Additivity (of exposures): The concept that two or more simultaneous exposures can result in an effect that is the same or greater than the sum of the effects caused by the exposures individually. If there is additivity, several simultaneous sub-threshold exposures may cause an observable effect [*].

Adsorption: A physical process in which molecules of gas, of dissolved substances, or of liquids adhere in an extremely thin layer to the surfaces of solid bodies with which they are in contact [18].

Aerosols: Small liquid droplets or solids of particle size up to 100 μm suspended in a gaseous flow or the atmosphere. Due to their small size, they can be readily dispersed. Condensation aerosols are formed when moisture-laden gases are cooled; dispersion aerosols are formed from the breakup of solids or atomization of liquids [13].

Air: The mixture of gases that constitutes Earth's atmosphere. The approximate composition of dry air is, by volume at sea level, 78 percent nitrogen, 21 percent oxygen, 0.9 percent argon, and 0.04 percent carbon dioxide, together with very small amounts of numerous other constituents. The water vapor content is highly variable and depends on atmospheric conditions. Air is said to be pure when none of the minor constituents is present in sufficient concentration to be injurious to the health of human beings or animals, to damage vegetation, or to cause loss of amenity (e.g., through the presence of dust, dirt, or odors or by diminution of sunlight) [13].

Air [ex]change rate: The ratio of the volumetric rate at which air enters (or leaves) a room or building divided by the volume of the room or building. Usually this is expressed in air changes per hour (ach or ACH) [from 21]. See also ventilation rate.

Air conditioning: (also known as environmental control) The artificial process of treating air to adjust its temperature, humidity, air quality, circulation and distribution as required by occupants, a process or a product in space [8].

Air distribution: The delivery, usually by mechanical means, of outdoor or conditioned air to various spaces in a building [8].

Air inlet: A deliberate opening in a room or a duct wall for the provision of outdoor conditioned air into a room [8].

Air pollution: The presence of unwanted substances (air pollutants) in the air. The term "unwanted substances" here refers to material in sufficient concentrations, present for a sufficient time, and under circumstances that interfere significantly with comfort, health, or welfare of persons, or with the full use and enjoyment of property [18]. (Terms often used in an equivalent fashion are “air contamination” or “air contaminants”.)

Air quality: (1) An indicator of the types and amounts of pollutants in the air that might cause discomfort or risk of adverse effects on human or animal health, or damage to vegetation. [*]. (2) Air quality is usually referenced to the concentration in air of one or more pollutants. For many pollutants, air quality is expressed as an average concentration over a certain period of time, e.g., $\mu g/m^3$ averaged over 8 hours [from 13].

Air quality criteria: The compiled knowledge that forms the scientific basis for establishing an air quality standard. This knowledge may include the latest available pertinent information on atmospheric science, air quality, exposure, dosimetry, health effects, and environmental effects of the pollutant [*].

Air quality guidelines: The WHO air quality guidelines (AQG) are the international reference work on the adverse effects of exposure to different air pollutants on human health. They provide a scientific basis for protecting human health from effects of air pollution [42].

Air quality standards: The level of pollutants prescribed by law that cannot be exceeded during a specified time in a defined area. [from 14].

Airtightness: A general descriptive term for the leakage characteristics of a building. The smaller the air leakage rate at a given pressure difference across a building envelope the greater the airtightness [8].

Allergen: (1) A substance, protein or non-protein, capable of inducing allergy or specific hypersensitivity [an immunological response]. (2) A protein of a food (such as milk, eggs, or wheat), bacteria, or pollen. Many substances in the environment can be allergens. The list of known allergens includes plant pollens, spores of mold, animal dander, house dust, foods, feathers, dyes, soaps, detergents, cosmetics, plastics, and drugs. Allergens can enter the body by being inhaled, ingested, absorbed through dermal contact, or injected. Once the allergen comes in contact with body cells it sets off a series of immune responses that can range from localized inflammation to a permanent immunological change to a fatal systematic anaphylaxis [from 12].

Allergy: A state of abnormal and individual hypersensitivity acquired through exposure to a particular substance called an allergen. Re-exposure reveals a heightened capacity to react. Allergies can be divided into three major types: (1) delayed-reaction allergies caused by sensitized lymphocytes; (2) antigen-antibody allergies caused by a reaction between gamma immunoglobulin (IgG) antibodies and antigens; and (3) atopic or inherited allergies, which are characterized by the presence of large amounts of sensitizing antibodies called IgE antibodies [12].

Ambient air: Any unconfined portion of the atmosphere; open air [*].

Ambient temperature: Temperature of the air (1) within a room or (2) outside the building or (3) surrounding the body [*].

Analyte: A substance, a property of which is to be measured by a chemical analysis [*].

Anemometer: An instrument that measures the speed or force of the wind [5].

Antagonism: A state in which the presence of two or more substances diminishes or decreases the toxic effects of the substances acting independently. It is the opposite of synergism [13]. See also additivity.

Antibacterial: (1) Destroying or suppressing the growth or reproduction of bacteria. (2) An agent having such properties [12].

Antibiotic: (1) Destructive of specific microbial life. (2) A chemical substance produced by a microorganism that has the capacity, in dilute solutions, to kill (biocidal activity) or inhibit the growth (biostatic activity) of other microorganisms. Antibiotics that are sufficiently nontoxic in appropriate doses to the host are used as chemotherapeutic agents in the treatment of infectious diseases [from 12]. (Specific microorganisms may develop a resistance to specific antibiotics. There are also potential ecological effects of antibiotics distributed in the water supply or other aquatic bodies used by humans and other animals.)

Antimicrobial: (1) killing microorganisms, or suppressing their multiplication or growth. (2) An antimicrobial agent [12].

Asbestos: Name given to a variety of fibrous silicate minerals of a certain shape and size, mainly calcium magnesium silicate. Used as a heat-insulating material and for fireproof fabrics [from 11].

Aspergillus: A genus of ascomycetous fungi. It includes several of the common molds and some that are pathogenic. It is characterized by rounded conidiospores thickly set with chains of black conidia. [23]

Asphyxiant: A vapor or gas that can cause unconsciousness or death by suffocation (lack of oxygen). Most simple asphyxiants are harmful to the body only when they become so concentrated that they reduce (displace) the available oxygen in the air (normally about 21%) to dangerous levels (18% or lower). Examples of simple asphyxiants are CO_2, N_2, H_2, and He. Chemical asphyxiants like carbon monoxide (CO), nitrogen oxide (NO), or cyanide reduce the blood's ability to carry oxygen [from 20].

Asthma: An inflammatory disease of the lungs characterized by reversible (in most cases) airway obstruction. Originally, a term used to mean “difficult breathing”; now used to denote bronchial asthma. Synonym: reactive airway disease [1].

Atmosphere: (1) Gaseous envelope surrounding Earth (or other heavenly body). The composition of Earth's atmosphere varies very slightly in different localities and according to altitude [11]. (2) The normal or standard unit of pressure. The pressure that will support a column of mercury 760 mm. high (29·92 inches) at 0^oC, sea level and latitude 45^o. One normal atmosphere = 1·0132 bars = 14·72 lb./sq. in. (approx.). Atmospheric pressure fluctuates about this value from day to day [11].

Bioaerosols: Airborne dispersions of particles containing whole or parts of biological entities, such as bacteria, viruses, dust mite and other insect proteins, pollen, fungal hyphae or fungal spores, dander, and other animal proteins [from 36].

Bioeffluents: Gases and vapors emitted from biologic organisms resulting from their metabolism [*].

Body odor: The odor originating from sweat and secretions from the skin, foul breath and gases from digestive tract. Odor emission is dependent upon diet, activity and personal hygiene [8].

Breathing zone: The air surrounding a person that is likely to be breathed [*]. See also occupied zone. In work environments breathing zone usually refers to a sphere with a radius 30 cm around your mouth and nose [*].

Building Envelope: The total area of the boundary surfaces if a building through which heat, light, air and moisture are transferred between the internal spaces and the outside environment [8].

Building Performance: A set of measured responses of a building, as a system, to defined forcing functions or criteria. Based on control theory and assuming the building as a system, two *a priori* definitions are needed: 1) Measured responses-- valid and reliable values of system parameters that are selected to characterize the intent of the performance during design, construction and operations (e.g., health, safety, security, occupant performance, productivity, energy, economics). Examples of system parameters are "system capacity" for design loads and "system controllability" for partial loads. Measured responses can be obtained during design, construction and operations. 2) Forcing functions -- physical and social forces that perturb the building system, which are characterized in terms of parameters (e.g., interior and exterior loads or source strengths) and values (e.g., intensities of structural, thermal, contaminant, lighting, acoustic loads -- normal conditions; and intensities and frequencies of natural and man-made physical and cyber threats - extraordinary conditions) to which the responses occur [*].

Carbon monoxide (CO): A colorless, odorless, tasteless gas formed by burning carbon or organic fuels with a limited supply of oxygen. Inhalation can cause central nervous system damage and asphyxiation, depending on the concentration and length of exposure [from 12]. The toxicity is based on a CO-hemoglobin reaction in the blood [*].

Carcinogen: Any compound or element that will induce or promote cancer in man or animal [from 13].

Certified Reference Material: A reference material, the composition or properties of which are certified by a recognized standards agency or group. An equivalent term is “standard reference material” [22]. Such materials are generally used for calibration of measurement systems, or for development or evaluation of measurement methods [from 22].

Chemical hypersensitivity: See multiple chemical sensitivity.

Chemosensory: Relating to the perception of chemical substances, as in odor detection [12].

Chromatography: An analytical technique used principally for separating and identifying the components of a sample by distributing them between a stationary and a moving phase. The stationary phase may be a solid, a liquid or a gas and may take the form of a porous column, a layer, or a film; the moving phase may be either a liquid or a gas. In gas chromatography (GC) the moving phase is a gas and the stationary phase is either a liquid or a solid [from 13].

Chronic exposure: Repeated exposure by the oral, dermal, or inhalation route for more than approximately 10% of the life span in humans (more than approximately 90 days to 2 years in typically used laboratory animal species) [9].

Chronic health effect: An adverse effect on a human or animal body with symptoms that develop slowly over a long period of time or that recur frequently [20] and may persist. An effect that occurs as a result of repeated or long-term (chronic) exposures [9] and may persist. See also acute health effect.

Chronic toxicity: The capacity of a substance to cause adverse human health effects as a result of chronic exposure [9]. See also acute toxicity.

Climate chamber: In IAS, a room with one or more controlled atmospheric conditions or elements. A climate chamber is often used in IAS for human or animal exposure experiments or for source emission characterization [*].

Comfort: A state of being free from annoyance [21].

Comfort zone: The range of indoor conditions considered acceptable by a large proportion of people working or living in the space [21].

Concentration: The amount of any substance in a given space, or in another substance, per definite amount of space or amount of the other substance. Concentration in aqueous solutions is usually expressed in grams, milligrams, moles or equivalents per liter [from 11]. Concentrations of gaseous pollutants in air can be expressed in volumetric units (e.g., ppm) or mass per volume (e.g., $\mu g/m^3$). Concentrations of particles in air are expressed in mass per volume units (e.g., $\mu g/m^3$).

Condensation: The process of converting a material in the gaseous phase to a liquid or solid state by decreasing temperature, by increasing pressure, or both [18].

Conditioning (environmental): (1) Providing specified climatic conditions for a given specific space and (2) The storage of a specimen under specified conditions such as temperature, humidity, and lighting for a specified time prior to testing [from 22].

Contaminant: An unwanted airborne constituent that may reduce the acceptability of the air and may be detrimental to the health of building occupants [8].

Cross Contamination: The contamination of one air stream of air by pollutants in another due to air movement between the two air streams [8].

Cross Ventilation: Air enters on one side of a room and leaves on a different side of the same room. Air flow between the entry and exit provides ventilation. Also used for flow between rooms where the inlet is in one room and the outlet in another [8].

Decipol: A sensory unit for perceived indoor air quality. One pol is the perceived air quality in a space where there is a sensory load of 1 olf, and where the space is ventilated at 1 L/s. A decipol is $1/10^{th}$ of a pol [6].

Dehumidifier: A device for reducing the content of moisture in air [*].

Detection limit: (1) A measure of the capability of an analytical method to distinguish samples that do not contain a specific analyte from samples that contain low concentrations of the analyte; the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability. Detection limits are analyte- and matrix-specific and may be laboratory-dependent [19]. See also quantifiable limit. (2) A stated limiting value that designates the lowest concentration or mass that can be estimated or determined with a specified confidence and that is specific to the analytical procedure used [22]. Unless otherwise stated, the detection limit is assumed to have a confidence interval measured by its variance (e.g., standard error) [*].

Dew-point temperature: The temperature at which dew (condensation) first appears on a solid surface whose temperature is steadily reduced below that of the surrounding moist air [13]. Temperature at which water vapor has reached the saturation point (100% relative humidity) [27].

Dehumidification: The process of reducing the moisture content of the air; serves to increase the cooling power of the air and can contribute to occupant comfort [8].

Demand-Controlled Ventilation (DCV): A ventilation strategy where the air flow is governed by a chosen pollutant contamination level. This level is measured by air quality sensors within the room or zone. When the pollutant concentration level rises above a preset level, the sensors activate the ventilation system. As

occupants leave the room the pollutant levels are reduced and ventilation is also reduced. Common pollutants are usually occupant dependent, such as carbon dioxide, humidity, or temperature [8].

Depressurization: A measurement technique used to evaluate the airtightness of a building or component. The air inside a room or building is extracted by the use of a fan creating a lower pressure inside than outside the room or building [8].

Diffusion (molecular): A process of spontaneous intermixing of different substances, attributable to molecular motion and tending to produce uniformity of concentration [22].

Dilution: (1) Reduction of concentration of an active substance by admixture of a neutral agent. (2) A substance that has undergone dilution, such as a prepared solution [from 12].

Dilution ventilation: See general ventilation.

Disinfectant: (1) Freeing from infection. (2) An agent that destroys infection-producing organisms. Heat and certain other physical agents such as live steam can be disinfectants, but in common usage the term is reserved for chemical substances (such as mercury dichloride or phenol). Environmental disinfectants are usually applied to inanimate objects since they are too strong to be used on living tissues. Chemical disinfectants are not always effective against spore-forming bacteria or viruses [from 12].

Dispersion: The most general term for a system consisting of particulate matter suspended in air or other gases [18]. Often referring to the dilution and reduction of concentration of pollutants in either air or water [13].

Displacement Flow: The displacement of internal room air by means of outdoor or conditioned air without appreciable mixing of the two masses. Very precise temperature and control conditions are required [8].

Dose: The quantity of a substance, amount of energy, or other challenge or remedy introduced into a target in a single application or in fractional amounts within a given period of time [from 1,2]. The amount of a substance available for interactions with metabolic processes or biologically significant receptors after crossing the outer boundary of an organism. The *potential dose* is the amount ingested, inhaled, or applied to the skin. The *applied dose* is the amount presented to an absorption barrier and available for absorption (although not necessarily having yet crossed the outer boundary of the organism). The *absorbed dose* is the amount crossing a specific absorption barrier (e.g. the exchange boundaries of the skin, lung, and digestive tract) through uptake processes. *Internal dose* is a more general term denoting the amount absorbed without respect to specific absorption barriers or exchange boundaries. The amount of the chemical available for interaction by any particular organ or cell is termed the *delivered* or *biologically effective dose* for that organ or cell [9].

Dose-response assessment: Estimation of the relationship between the dose and the severity of an effect [*]. A determination of the relationship between the magnitude of an administered, applied, or internal dose and a specific biological response. Response can be expressed as measured or observed incidence or change in level of response, percent response in groups of subjects (or populations), or the probability of occurrence or change in level of response within a population [9].

Draft or Draught: Excessive air movement to an occupied enclosure causing discomfort [21].

Dry-bulb temperature: The temperature of air that is measured by the dry-bulb thermometer of a psychrometer [17].

Dust: Particulate matter that varies in size and may be airborne or deposited on a surface. If airborne, it is usually referred to as suspended particulate matter [*].

Electrostatic air cleaner: An air pollution control device that imparts an electrical charge to particles in a gas stream, and then causes them to collect on oppositely charged or electrically neutral electrodes [*].

Effective temperature: An empirical index of thermal comfort that takes into account dry bulb and wet bulb temperatures and air movement [21].

Efficiency: (1) The ratio of energy output to the energy input of a process or a machine [26]. (2) A measure of the performance of an air-cleaning device. Usually it is reported as the ratio of removed concentration to inlet concentration of a pollutant, expressed as a percentage:
Efficiency = [(inlet concentration – outlet concentration)/(inlet concentration)] x 100%
Also referred to as the "single-pass efficiency" [*].

Electron capture detector (ECD): This instrument uses a weak beta source, (usually Ni63, half-life 92y) to generate electrons in an ionization chamber, which is subjected to a pulsed voltage, thus generating a current. Electron-capturing material in the sample reduces the number of electrons in the chamber and thus the current. Electron-capturing materials are normally halogenated substances such as SF_6, trichloroethylene, CCl_4, chloroform and refrigerant gases [21].

Emission: A release of a pollutant from a source, commonly expressed either as a rate (amount per unit time) or as the amount of pollutant per unit of source activity [from 2]. See also emission factor.

Emission factor: The mass of a given pollutant produced relative to each unit of process. For example, this may be per unit mass of fuel consumed. Alternatively, and emission factor may be expressed as a mass emission rate per unit of production (e.g., milligrams per hour, per square meter of painted surface), or per item of production (e.g., milligrams per hour, per piece of furniture) [*]. See also specific emission rate.

Emission inventory: A listing, by source, of the amounts of air pollutants discharged into the air per unit time. An emission inventory of a building might consist of all relevant sources in the building, and measured or estimated emission rates [*].

Emission rate: Amount of air pollutants emitted per unit time from a source [*].

Endemic: (1) Present in a community at almost all times. (2) A disease of relatively low morbidity that is constantly present in a human community, but clinically recognizable in only a few [from 12].

Environmental health: Those aspects of human health and disease that are determined by factors in the environment. It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect health. Environmental health includes both the direct pathological effects of chemicals, radiation and some biological agents, and the effects (often indirect) on health and well-being of the broad physical, psychological, social and aesthetic environment, which includes housing, urban development, land use and transport [from 2].

Epidemiology: (1) The study of the relationships of various factors determining the frequency and distribution of diseases in the human community. (2) The field of medicine dealing with the determination of specific causes of localized outbreaks of infection, toxic poisoning, or other disease of recognized etiology [12]. (3) The study of the etiology and natural history of a disease [41].

Epithelium: The cellular covering of internal and external surfaces of the body, including the lining of vessels and other small cavities. It consists of cells joined by small amounts of cementing substances. Epithelium is classified into types on the basis of the number of layers deep and the shape of the superficial cells [12].

ETS: Environmental tobacco smoke. ETS is a dynamic, complex mixture of more than 4,000 chemicals found in both vapor and particulate phases. Many of these chemicals are known toxic or carcinogenic agents. Almost all the compounds found in "mainstream" smoke, the smoke inhaled by the active smoker,

are also found in "sidestream" smoke, the emission from the burning end of the cigarette, cigar, or pipe; additional compounds may be generated by sidestream smoke alone. ETS consists of both sidestream smoke and exhaled mainstream smoke. Inhalation of ETS is often termed "secondhand smoking", "passive smoking", or "involuntary smoking" [from 31].

Evaporation: Conversion of a liquid into vapor, without necessarily reaching the boiling point [from 11].

Exfiltration: Uncontrolled outward air leakage from conditioned spaces through unintentional openings in ceilings, floors, and walls to unconditioned spaces or the outdoors caused by pressure differences across these openings due to wind, inside-outside temperature differences (stack effect), and imbalances between supply and exhaust airflow rates [26].

Exhaust (air): Air removed from a space and discharged to outside the building by means of mechanical or natural ventilation systems [26]. Exhaust: (1) Technology: Transitive and intransitive verb to escape, or allow steam or waste gases to escape, at the end of an industrial process. Waste gases are exhausted through the flue. Science: Transitive verb to remove all of the air or gas from a container in order to create a vacuum inside it. (2) The discharge of waste gases, vapor, and fumes created by and released at the end of a process, especially from the working of an internal-combustion engine. (3) A pipe or other piece of apparatus through which waste gases escape [31].

Exposure: Contact made between a chemical, physical, or biological agent and the outer boundary of an organism. Exposure is sometimes quantified as the amount or concentration of an agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut) [9]. Exposure may also be quantified as the product of the concentration and the time exposed, or the sum of such products over a specified time [*].

Exposure assessment: Determination of the emissions, pathways and transformations to estimate the concentrations and doses to which humans are or may be exposed [*]. An identification and evaluation of the human population exposed to a compound such as a toxic agent, describing its composition and size, as well as the type, magnitude, frequency, route and duration of exposure [9].

Extract Ventilation: A mechanical ventilation system in which air is extracted from space or spaces creating an internal negative pressure. Supply air is drawn through adventitious or intentional openings. Such a system allows heat to be recovered using an exhaust air heat pump [8].

Fiber: A basic form of matter, often crystalline, with a high ratio of length to diameter. Examples: animal (wool); vegetable (cotton); mineral (asbestos, steel); and synthetic (rayon, carbon, high polymers) [20].

FID: See flame ionization detector.

Filter: A porous medium for collecting particulate matter [18].

Flame ionization detector (FID): One of several gas chromatography detectors. Detects ions created by combustion of gases in a hydrogen flame [*].

Flue gas: The air coming out of a chimney after combustion. It can include carbon oxides, water vapor, nitrogen oxides, sulfur oxides, particles, and many chemical pollutants [*].

Fresh air: Air taken from outside a building to replace all or part of the air in a conditioned space. Also referred to as outdoor air, outside air, and replacement air [26].

Fume: There is no generally accepted definition of the word, but it is usually taken to mean very small particles less than 1 micrometer in diameter suspended in air or flue gases or, 'fume is any airborne solid matter smaller than dust'. Fumes are usually released as a result of certain metalworking and chemical processes. The term is also often used to describe the vapors given off by a liquid, especially if they are offensive or toxic [13].

Fungi: A group of organisms that includes mushrooms, yeasts (for convenience of terminology), and molds. Fungi lack chlorophyll, have a rigid cell wall in some stage of the life cycle, and reproduce by means of spores. Fungi are present in soil, air, and water, but only a few species cause disease [from 12].

Gas: The state of matter in which the molecules are practically unrestricted by intermolecular forces so that the molecules are free to occupy all space within an enclosure [22].

Inert gas: A gas that does not react with materials with which it is in contact, such as nitrogen, helium, and argon [from 13].

Laughing gas: Nitrous oxide, N_2O [12].

Liquefied petroleum gas (LPG): A gaseous mixture of light hydrocarbons, whose principal components are propane, propene, butanes, and butenes, liquefied by increased pressure or lowered temperature [13].

Natural gas: A mixture of natural hydrocarbon gases associated with oil production, principally methane and some ethane [13].

Gas chromatography: An analytical separation technique where the minor components in a mixture of gases are separated and resolved into individual components. This technique requires the transmission of the gas sample through a column in the chromatograph using a mobile phase or carrier gas. The column is either packed or coated with a material for which the gases to be separated have an affinity; the strength of this affinity largely determines the time any individual component is retained in the column. Various detectors are employed in gas chromatography, from very specific compound-responsive detectors (flame photometric detector, electron capture detector, photoionization detector, etc.) to some very generally sensitive detectors (flame ionization detector, thermal conductivity detector, atomic emission detector, etc.) [32].

Gas laws: Statements as to the physical changes of gases under the effect of alterations of pressure, volume, mass (moles), or temperature. Boyle's law states that at constant temperature the volume of a given mass of gas is inversely proportional to the pressure; i.e., PV = constant. Charles' law states that at constant pressure all gases expand by 1/273 of their volume at 0 ^{o}C for a rise in temperature of 1 ^{o}C; i.e., the volume of a given mass of gas at constant pressure is directly proportional to the absolute temperature. The two laws may be combined in the expression PV = nRT, where n is the number of moles and T is the absolute temperature; or, for a gram-molecule of a gas, PV = RT. This gives the behavior of an "ideal" gas when both temperature and pressure are altered [from 11]. The gas laws predict actual gas behavior sufficiently accurately for most applications in the indoor air sciences

General ventilation: Also known as dilution ventilation. The removal of contaminated air and its replacement with clean air from the general building area as opposed to local ventilation, which is specific air changing in the immediate air of contamination source. An example of local ventilation is a laboratory fume hood [20].

Grab sample: A single sample that is collected at one point in time and place [*].

Gram-molecular volume: The volume occupied by one gram-molecule of a gas. Approximately the same for all gases under the same conditions of temperature and pressure; at a pressure of 760 mm and 0^{o}C, equal to 22.415 liters for a perfect gas [11]. Also referred to as molar volume.

Gravimetric: Pertaining to measurement by weight: performed by weight, as the gravimetric method of drug assay [12].

Guideline: In environmental medicine, a collection of criteria specifically assembled to indicate threshold levels of a harmful or noxious agent consistent with the maintenance of good health [2]. See also air quality guidelines.

Half-life: (1) Time needed for half a quantity of ingested material to be eliminated from the body naturally. Also radiobiological half-life: Time needed for ingested radioactive material to deliver half its radiation dose. This allows for both decay in activity and the time in the body. (2) Radioactive half-life is the time taken for half the number of atoms of a radioactive substance to decay to atoms of a different mass. Different radionuclides have different half-lives [13].

Headspace: The unfilled space in a container fitted with a closure device [from 22].

Health: (1) Generally: A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity [3]. (2) In medicine: The state of optimal functioning of the organism without evidence of disease or abnormality [1]. (3) In IAS: A state of complete physical, mental, and social well-being taking into account relevant cofactors such as age, gender, etc. [*]. [A more standard bio-medical definition is "Biological homeostasis not involving patho-physiological phenomena."]

Heat Exchanger: A device designed to transfer heat from two physically separated fluid streams. In buildings, it is generally used to transfer heat from exhaust warm air to incoming cooler air [8].

Heating season: Period of the year during which space heating is normally necessary in a building to achieve comfort conditions [21].

HEPA: High-efficiency particulate arrestance. Used in describing highly efficient air-purification and respirator equipment [*].

Herbicide: A chemical that controls or destroys undesirable plants [*].

Humidification: The process of transferring a mass of water to the atmospheric air [8].

Humidifier fever: Humidifier fever is a disease of uncertain etiology. It shares symptoms with hypersensitivity pneumonitis, but the high attack rate and short-term effects may indicate that toxins (e.g., bacterial endotoxins) are involved. Onset occurs a few hours after exposure. It is a flu-like illness marked by fever, headache, chills myalgia and malaise but without prominent pulmonary symptoms. It normally subsides within 24 hours without residual effects, and a physician is rarely consulted. Humidifier fever has been related to exposure to amoebae, bacteria, and fungi found in humidifier reservoirs, air conditioners and aquaria. The attack rate within a workplace may be quite high, sometimes exceeding 25 percent [31].

Humidity: A measure of the water vapor present in the air. Various related terms follow [27]:

Absolute humidity: in a mixture of water vapor and dry air, the mass of water vapor in a specific volume of the mixture.

Humidity, percentage: the ratio in percent of the mass of moisture at a given temperature (humidity ratio) to the maximum possible (humidity ratio saturated) at the same temperature.

Humidity ratio: ratio of the mass of water vapor to the mass of dry air in a parcel or volume of air.

Humidity ratio, saturation: ratio of the mass of water vapor to the mass of dry air in a parcel or volume of air that is saturated with water vapor.

Relative humidity: (1) ratio of the partial pressure or density of water vapor to the saturation pressure or density, respectively, at the same dry-bulb temperature and barometric pressure of the ambient air. (2) Ratio of the mole fraction of water vapor to the mole fraction of water vapor saturated at the same temperature and barometric pressure.

Specific humidity: ratio of the mass of water vapor to the total mass of a moist air sample. Often incorrectly used as a synonym for humidity ratio (the mass of water vapor to the mass of the dry-air component of a moist air sample).

HVAC: Heating, ventilation and air conditioning. Used in describing mechanical systems that provide delivery and distribution of air for good indoor air quality and thermal comfort [*].

Hydrocarbons: Compounds that contain only carbon and hydrogen. This term is sometimes used loosely to include substances that also contain other elements such as oxygen [*].

Hygiene: (1) The science of health and its preservation. (2) A condition or practice, such as cleanliness, that is conducive to preservation of health [12].

Hypersensitivity: A state of altered reactivity in which the body reacts with an exaggerated immune response to a foreign agent. Anaphylaxis and allergy are forms of hypersensitivity [12, 24].

Contact h., that produced by contact of the skin with a chemical substance having the properties of an antigen or hapten; it includes Contact Dermatitis.

Delayed h., a slowly developing increase in cell-mediated immune response (involving T-lymphocytes) to a specific antigen, as occurs in graft rejection, autoimmune disease etc.

Immediate h., antibody-mediated hypersensitivity characterized by lesions resulting from release of histamine and other mediators of hypersensitivity from reagin-sensitized mast cells, causing increased vascular permeability, edema, and smooth muscle contraction; it includes anaphylaxis and atopy.

IAQ: See Indoor Air Quality.

Immune response: The reaction to and interaction with substances interpreted by the body as not-self, the result being humoral and cellular immunity. Called also immune reaction. The immune response depends on a functioning thymus and the conversion of stem cells to B- and T-lymphocytes. These B- and T-cells contribute to antibody production, cellular immunity, and immunologic memory [12]. Neurological and biochemical changes may trigger cytokine production and cellular changes, changes in receptors, and other enzymatic changes that can also be considered an immune response.

Impactor: A sampling device that employs the principle of impaction (impingement). The "cascade impactor" refers to a specific instrument that employs several impactions in series to collect successively smaller sizes of particles [18].

Indoor (air environment): An air compartment for which the air exchange to surrounding air compartments or to the ambient air is limited by building components. In the IAS, this term generally refers to non-industrial workplace environments [*].

Indoor black residue: Any unexpected visible staining of or deposition on interior surfaces of buildings or their contents (e.g., walls, carpeting, appliances, cabinetry, plastic utensils, etc.). Indoor black residue is the preferred alternative to terms "black soot", "ghosting", or "graying" often used to describe this phenomenon. Indoor black residue may be composed of non-biological particulate matter as well as viable or nonviable material of biological origin. Sources include material aerosolized by combustion, deposition and subsequent growth of molds and other microorganisms, and accumulations of low volatility gas-phase chemicals that have evaporated and subsequently condensed onto cooler surfaces [*].

Indoor climate: The state and development of the atmospheric environment in a building [*].

Indoor Air Quality: (1) The extent to which objective IAQ guidelines are met. (2) The subjective rating of acceptability of an indoor atmospheric environment [*]. See also perceived air quality.

Indoor Environment: (see indoor Climate)

Industrial hygiene: A specialized area within the field of occupational health and safety, industrial hygiene has as its goal the recognition, evaluation, and control of worker exposures to harmful physical or chemical agents or conditions. Industrial hygienists may conduct workplace monitoring of noise levels, ventilation rates, airborne contaminants, heat exposures, and radiation dose. Various engineering, administrative, and other methods are employed to control or reduce worker exposures [38]. (1) The science of health and its preservation in industry. (2) A condition or practice, such as cleanliness, that is conducive to preservation of health in the industry/ or in the working place [12].

Infiltration: Uncontrolled inward air leakage to conditioned spaces through unintentional openings in ceilings, floors, and walls from unconditioned spaces or the outdoors caused by the same pressure differences that induce exfiltration [28]. The diffusion or accumulation in a tissue or cells of substances not normal to it or in amounts in excess of the normal; also, the material so accumulated [12]. (1) The downward

flow of water through the soil surface into subsurface strata. (2) The term is also used to denote the contamination of wells by salt water or the spoiling of an aquifer by pollutants, e.g. by leachate from a landfill site [13]. Any morbid condition of a tissue due to the presence of a substance not normal to it [23].

Infiltration Rate: The rate at which outside air infiltrates a room or building. Equivalent to fresh air change rate, usually expressed in air changes per hour (ach) or liters per second (l/s).

Ingestion: The taking of food, drugs, toxins, etc., into the body by mouth [from 12].

Inhalation: (1) The drawing of air, with or without other substances therein, into the lungs. (2) Any drugs or solution of drugs administered (as by means of nebulizers or aerosols) by the nasal or oral respiratory route [from 12].

Inorganic materials: Compounds derived from other than vegetable or animal sources that generally do not contain carbon atoms. Some simple carbon-containing compounds are considered to be inorganic (e.g., carbides, CO, CO_2, carbonates, CS_2) [20].

Integrated Risk Information System (IRIS): A database of health effects information maintained by the U.S. Environmental Protection Agency [*].

Intentional Ventilation: Ventilation provided through the use of purpose provided openings such as windows [8].

Irritation (sensory and inflammatory): (1) Pathological response of tissue to injury; or incipient (early stage) inflammation. (2) A response of nerve or muscle to a stimulus. (3) The evocation of a normal or exaggerated reaction in the tissue by the application of a stimulus [*].

Isokinetic sampling: A term describing a condition of sampling in which the flow of gas into the sampling device (at the opening or face of the inlet) has the same flow rate and direction as the ambient atmosphere being sampled [18].

Lacrimation: Secretion and discharge of tears [12].

Laminar flow: A fluid flow pattern in which each layer of liquid or gas flows smoothly and is not broken up. When the flow becomes mixed up it is said to be turbulent [13].

Leakage Path: A route by which air enters or leaves a building or flows through a component [8].

Legionnaires' disease: A pulmonary form of Legionellosis, resulting from infection with *Legionella pneumophila*. The disease acquired its name from an outbreak that occurred during the 1976 convention of the American Legion in Philadelphia [12]. A pulmonary form of legionellosis, resulting from infection with *Legionella pneumophila.* The disease is of greatest risk in middle-aged to elderly men, especially if they are cigarette smokers or are immunosuppressed; it has occurred in children and normal adults as well. Specific diagnostic tests for Legionnaires' disease include both direct and indirect fluorescent testing for antibodies against the organism. Other laboratory tests reveal mild leukocytosis; elevated erythrocyte sedimentation rate; increased liver enzymes, especially lactate dehydrogenase; elevated blood urea nitrogen; and abnormal blood gases show hypoxemia and hypocarbia. Pulmonary symptoms of Legionnaires' disease are typical of pneumonia; however, patients do not respond to the usual therapy for pneumonia and there can be permanent lung damage. Possible non-pulmonary complications include liver damage, altered levels of consciousness owing to neuronal involvement, and renal abnormalities that can require renal dialysis. Treatment consists of erythromycin and, in patients who do not respond to erythromycin alone, rifampin plus erythromycin. Severe hypoxia requires mechanical ventilation and oxygen therapy. Isolation of the patient is not considered to be necessary; however, respiratory precautions are indicated. Supportive measures to help the patient cope with high fever, nausea and vomiting, and renal failure are essential components of patient care [from 12].

LOAEL: lowest-observed adverse-effect-level. LOAEL refers to that dose rate of chemical at which there are statistically or biologically significant increases in frequency or severity of adverse effects between the exposed and control groups. Units are (mg/kg body weight/day) [10].

Log normal: The lognormal distribution is defined with reference to the normal distribution. A random variable X has a lognormal distribution if its logarithm, Y = ln (X), has a normal distribution. Consequently, lognormal distribution is a probability distribution in which the log of the random variable is normally distributed, meaning it conforms to a bell curve [*].

Malaise: A feeling of uneasiness or indisposition [12], often accompanied by fatigue.

Makeup Air: Outdoor air supplied to replace exhausted air [8].

Mechanical ventilation: Ventilation provided by mechanically powered equipment, such as motor-driven fans and blowers, but not by devices such as wind-driven turbine ventilators and mechanically operated windows [28].

Mechanical extract ventilation system: A ventilation system in which air is extracted from a space, thereby creating an internal negative pressure. Supply air is drawn through adventitious or purposely provided openings [8].

Mechanical supply ventilation system: A ventilation system in which air is supplied to a space, thereby creating an internal positive pressure. Air leaves the space through adventitious or purposely provided openings [8].

Microbe: A microorganism, especially a pathogenic bacterium [12].

Moisture content: (1) The amount of moisture in a substance expressed as the mass of moisture per unit mass of the dry substance. (2) The amount of moisture in a substance per unit mass of the moist substance. (3) For moist air, the mass of water vapor per unit mass of dry air; the preferred term is humidity mixing ratio [21]. See also humidity mixing ratio, specific humidity, absolute humidity, and relative humidity.

Mold: Any of a group of parasitic and saprophytic fungi causing a colony growth on organic substances; also, the deposit of growth produced by such fungi [12].

Mole: The quantity of a chemical substance that has a weight in a unit (usually grams) numerically equal to its molecular weight. It is that amount of a material that has 6.023×10^{23} molecules (Avogadro's number). For example, NaCl has a formula weight of 58.5 (Na, 23, and Cl, 35.5). One mole of NaCl is 58.5 g [20].

Molecular weight: The mass in grams per mole of a substance [20].

Morbidity: (1) The condition of being diseased. (2) The ratio of sick to well persons in a community [12]. (3) The ratio of sick to all people in a community (called a morbidity rate) [42].

Mucosa, mucous membranes: A mucous tissue lining various tubular structures, consisting of epithelium, lamina, propria, and, in the digestive tract, a layer of smooth muscle [1].

Multiple chemical sensitivity: Disorder triggered by exposures to chemical in the environment; it begins with short-term, severe chemical exposure, such as a chemical spill, or a longer-term exposure, such as a poorly ventilated office. After initial exposure low levels of chemicals found in every day materials such as soaps, detergents, cosmetics and newspaper inks can trigger symptoms in persons with multiple chemical sensitivity. Symptoms may include: headaches, rashes, asthma, depression, muscle and joint aches, fatigue, memory loss and confusion. Sources such as the Centers for Disease Control and Prevention (CDC) and the American Medical Association (AMA) do not recognize this as a medical diagnosis, nor is there any official

medical definition because symptoms and chemical exposures are often unique and vary widely among individuals [4]. See also [43].

Mutagen: Something (e.g., a chemical or radiation) that changes the genetic material (chromosomes) that is transferred to the daughter cells when cell division occurs. The result is that the new cells have changed characteristics [*]. Mutagens may also be carcinogenic or teratogenic, and therefore any substance that is found to be mutagenic must be tested for its carcinogenic and teratogenic properties as well. Although mutagens may not be carcinogens or teratogens, they must be considered suspect until cleared. This conservative viewpoint is essential if human health is to be protected. There is often a major time lag between contact with a mutagenic agent and the onset of cancer in man. The World Health Organization Scientific Group on the Evaluation and Testing of Drugs for Mutagenicity stated that the following should receive special attention:

(1) Compounds that are chemically, pharmacologically and biochemically related to known or suspected mutagens;
(2) Compounds that exhibit certain toxic effects in animals, such as depression of bone marrow; inhibition of spermatogenesis or oogenesis; inhibition of mitosis, teratogenic effects, carcinogenic effects, causation of sterility or semi-sterility in reproduction studies; stimulation or inhibition of growth or synthetic activity of a specific cell or organ; inhibition of immune response; and
(3) Compounds that are likely to be continuously absorbed into the body and retained by it for long periods.

The testing should be done with mammals, e.g. rodents, so that an indication of the potential effects on humans may be determined. The finding of mutations in one species does not mean that it is mutagenic in all species, but a positive finding should certainly be considered as an indication of potential mutagenic activity in man [13].

Natural ventilation: Ventilation provided by thermal, wind, or diffusion effects through doors, windows, or other intentional openings in the buildings [28].

Nausea: An unpleasant sensation vaguely referred to the epigastrium and abdomen, with a tendency to vomit. Nausea may be a symptom of a variety of disorders, some minor and some more serious. Nausea and vomiting may be set off by nerve signals from many other parts of the body besides the stomach. For example, intense pain in almost any part of the body can produce nausea. The reason is that the nausea-vomiting mechanism is part of the involuntary autonomic nervous system. Nausea can also be precipitated by strong emotions [12].

Nebulizer: An atomizer; a device for creating a spray [12].

Nephelometer: An instrument for measuring the concentration of substances in suspension by the amount of light that is scattered by the suspended particles [12].

Neutral pressure level: Level at which the air pressure difference, derived from the stack effect between inside and outside a building, is zero [8].

NO_x: Oxides of nitrogen (NO, NO_2, and N_2O_4). Gases that react with the moisture in the respiratory tract to produce acids that corrode and irritate tissue, causing congestion and pulmonary edema. Symptoms of acute exposure can develop over 6 to 24 hours. Chronic exposure to low levels can cause irritation, cough, headache, and tooth corrosion. Exposure to 5 to 50 ppm of NO_2 can cause slowly evolving pulmonary edema [20].

Non-industrial environment: The environment of humans who are not involved in industrial production processes. Includes offices, public places, commercial establishments, residential buildings, etc. [*].

NTP, STP: Normal (standard) temperature and pressure. A pressure of 760 mm of mercury (101.3 kPa) and a temperature of 0^o C (273 K); standard conditions under which volumes of gases are compared [11, 13].

Nuisance particles: Dusts that do not produce significant organic disease or toxic effect from "reasonable" concentrations and exposures. These particles have a TLV of ≥10 mg/m^3 or ≥30 mppcf [20]. They can reduce visibility and may produce material damage.

Occupancy: The time during which one occupies a building [21].

Occupant: A person who on a regular basis is exposed to the indoor environment of a building [*].

Occupational exposure limits: That level or concentration of chemical agent to which a worker is exposed determined either as a time time-weighted average (TWA), or as a ceiling limit for a shorter period of time, which is at or in excess of those stated [22].

Occupied zone: The region within an occupied space between planes 75 and 1800 mm above the floor and more than 600 mm from the walls or fixed air-conditioning equipment [28].

Odor: Emanation from any substance that stimulates the olfactory sensory cells [1].

Odor threshold: In principle, the lowest concentration of an odorant that can be detected by a human being. In practice, a panel of "sniffers" is normally used and the threshold taken as the concentration at which 50% of the panel can detect the odorant (although some workers have also used 100%) [2].

Olf: A unit for emission rate of bioeffluents and other indoor air pollutants. Reflects the perceived air pollution caused by emissions from a standard person in thermal comfort and ventilated by 10 L/s unpolluted air [6].

Olfactometer: An instrument for testing the sense of smell [12].

Olfactory: Pertaining to the sense of smell [11].

Olfactory nerve: The first cranial nerve: it is purely sensory and is concerned with the sense of smell. The nerve cell bodies are situated in the olfactory area of the mucous membrane of the nose. The nerve fibers lead upward through openings in the ethmoid bone and connect with the cells of the olfactory bulb. From there the fibers pass inward to the cerebrum [12].

Occupant Behavior: The pattern of activity of occupants in a building, their distributions, activities and time spent within the building and how they interact with building facilities such as ventilation systems, window openings etc**.** [8].

Organic compounds: Chemical compounds containing carbon combined with hydrogen, and often also with oxygen, nitrogen, and other elements. The molecules of organic compounds are often very complex, and can contain a large number of atoms. They are not usually ionized in solution, and frequently show the phenomenon of isomerism [11].

Organic gases and vapors: Compounds containing carbon atoms [*]. See also volatile organic compounds.

Outdoor air: (Also ambient air, environmental air). Air outside a building or enclosure [21].

Outgassing: The process by which materials emit gases [22].

Pain: An unpleasant sensation associated with actual or potential tissue damage and mediated by specific nerve fibers to the brain where its conscious appreciation may be modified by various factors [1].

Panel (Organoleptic panel): A group of assessors chosen to participate in a sensory test [2].

Partial pressure: In a mixture of two or more non reacting gases or vapors, the pressure that an individual gas would exert if it was present alone and occupied the same volume as the whole mixture [*].

Particles (particulate matter): Fine solids or liquid droplets suspended in the air or in emissions. The term “particulates” is often used to refer to airborne particles, but this usage is grammatically incorrect [*].

Particleboard: A genetic term for a panel manufactured from lignocellulosic materials (usually wood) primarily in the form of discrete pieces or particles, as distinguished from fibers, combined with a synthetic resin or other suitable binder and bonded together under heat and pressure [from 22].

Particle size: The size of liquid or solid particles expressed as the average or aerodynamically equivalent diameter [18].

Particle size distribution: The relative percentage by weight or number of each of the different size fractions of particulate matter [18].

Parts per billion, parts per million: See PPB, PPM.

Passive smoking: Breathing environmental tobacco smoke (ETS) [*].

Patch test: A test for hypersensitivity in which filter paper or gauze saturated with the substance in question is applied to the skin, usually on the forearm. A positive reaction is reddening or swelling at the site [12].

Perceived Air Quality (PIAQ): The air quality as rated by humans in subjective evaluations [*].

Perfect mixing or uniform mixing: Combination of two or more substances such that the parts of one are wholly distributed throughout the parts of another [8].

Peripheral nervous system: The portion of the nervous system consisting of the nerves and ganglia outside the brain and spinal cord [12].

Permeation tube: A sealed polymer tube containing a liquefied sample of a gas to be measured. Used for calibrating instruments and analytical methods for measuring concentrations of pollutants in air. At a fixed temperature, the liquefied gas diffuses through the walls of the tube at a constant rate, so that by allowing a stream of air to flow past the tube at a known rate, mixtures of this gas with air at very low, but accurately known, concentrations can be prepared [13].

Perspiration: (1) Sweating; the excretion of moisture through the pores of the skin. (2) Sweat; the salty fluid, consisting largely of water, excreted by the sweat glands in the skin [12].

Pesticide: A product or substance used in the control of pests such as vermin, mosquitoes, moulds and weeds, all of which may affect public health or attack resources of use to humans. (The term subsumes insecticides with which it is often used interchangeably). There are three main classes [13]:
(1) Chlorinated hydrocarbons (e.g., DDT), which are long-lived and capable of being concentrated biologically.
(2) Organophosphates, which are short-lived and degrade to "harmless" end products.
(3) Artificial pyrethrins, originally based on natural sources from pyrethrum flower heads but now being synthesized in very large amounts.

pH: A measure of the alkaline or acid strength of a substance. The pH value of any solution in water is expressed on a logarithmic scale to the base 10. It is defined and calculated as the logarithm of the reciprocal of the hydrogen-ion concentration of a solution and may be expressed in symbolic form as: $pH = -\log [H^+]$, where $[H^+]$ is the concentration of hydrogen ions in moles per liter [13].

Pheromone: A substance secreted to the outside of the body and perceived (as by smell) by other individuals of the same species, releasing specific behavior in the percipient [12].

Photochemical reaction: Any chemical reaction that is initiated as a result of absorption of light [18].

Photo Ionization Detector (PID): An ion detector used to measure ions created by ultraviolet radiation of airborne chemicals. Often used as a detector in gas chromatography [*].

Piston flow or plug flow or displacement flow: The ventilation air acts as a piston, which pushes the "old" air in the room in front of it without actually mixing. Therefore all of the air that reaches an arbitrary point from a small packet of fresh air at the inlet does so at the same time; this time is by definition the local mean age of air at this point. This flow is considered the most efficient form of ventilation [8].

Placebo: A substance given to a patient as medicine or a procedure performed on a patient that has no intrinsic therapeutic value and relieves symptoms or helps the patient in some way only because the patient believes or expects that it will. A placebo may be prescribed to satisfy a patient's psychological need for drug therapy and may be administered in the form of a sugar pill or an injection of sterile water. Placebos are also used in controlled clinical trials of new drugs. While some patients selected at random are given the new drug, others are given a placebo. Often this is an active placebo that mimics the new drug's side effect. Neither the patients nor the physicians know who is receiving the real drug. The patients taking the new drug must have significantly more relief of symptoms than the control group taking the placebo for the new drug to be considered to be effective. Placebos can produce an effect that is either positive, with improvement of symptoms, or negative, with worsening of symptoms or the appearance of adverse side effects. The origin of the word "placebo" is the Latin word meaning "I will please". The term can be used to cover all nonspecific aspects of treatment, particularly the patient's beliefs and expectations, the physician or therapist's beliefs and expectations, and the psychological interaction between patient and therapist. The patient's anticipation that a placebo will produce a physiologic effect can lead to the realization of that effect. This is not a case of gullibility, emotional instability, or deception of the patient, although these often have been given credit for the positive effects of a placebo. Rather, it is an example of mind-body interaction that has been observed from the earliest days of medical practice when ancient healers used anything from crocodile dung to powdered buffalo horn to cure the ills of clients. Today, the placebo effect is being reconsidered and respected as a legitimate therapeutic tool that can be used without deception to enhance the practice of modern health care [12].

Poison: A substance that, on ingestion, inhalation, absorption, application, injection, or development within the body, in relatively small amounts, may cause structural damage or functional disturbance [12].

Pol: A sensory unit for perceived indoor air quality. See decipol.

Pollen: The male fertilizing element of flowering plants [12].

Pollutant (or contaminant, of air, specifically herein): A substance that, if present in sufficient concentration in indoor air, degrades air quality or perceived air quality by causing adverse health effects [*]. See also Air pollution.

Potentiation: Enhancement of the effect of one agent by another so that the combined effect is greater than the sum of the effects of each agent alone. [*] Also called synergism or multiplicative effects.

Pollution Source: See source.

PPB, ppb: In air quality studies, a unit of measure of the concentration of gases in air expressed as parts of the gas per billion (10^9) parts of the air-gas mixture. Both are represented on a volumetric basis (e.g., liters of gas per billion liters of air-gas mixture). One advantage of this unit of measure is that, if one assumes ideal gas conditions (a sufficient assumption for most practical applications), it is independent of temperature and pressure. Note that this unit of measure is not applicable to concentrations of particles in air, which are represented by mass/volume units such as micrograms of particles per liter of air. Note also that this unit is different from the PPB unit for liquid and solid mixtures, where the normal basis is mass (e.g., grams of substance per billion grams of mixture [*].

PPM, ppm: In air quality studies, a unit of measure of the concentration of gases in air expressed as parts of the gas per million (10^6) parts of the air-gas mixture. Both are represented on a volumetric basis (e.g., liters of gas per million liters of air-gas mixture). One advantage of this unit of measure is that, if one assumes ideal gas conditions (a sufficient assumption for most practical applications), it is independent of temperature and pressure. Note that this unit of measure is not applicable to concentrations of particles in air, which are

represented by mass/volume units such as micrograms of particles per liter of air. Note also that this unit is different from the PPM unit for liquid and solid mixtures, where the normal basis is mass (e.g., grams of substance per million grams of mixture) [*].

Pressure: Force per unit area. Measured in the SI system in Newtons per square meter. Note: the bar (1 bar = 10^5 N/m^2) and millibar (1 mbar = 10^2 N/m^2) are in very common use, the former for high pressures and the latter for variations in atmospheric pressure [*].

Pressurisation (U.S.A.: pressurization): A method of testing for air leakage of a building or component by installing a powerful fan in the building envelope, e.g. through a door or window, and creating a static pressure excess inside the building. The flow rate through the fan and the pressure difference across the envelope are measured and air leakage assessed [21].

Preventive maintenance: An orderly program of activities designs to ensure against equipment failure [19].

Primary air: (1) Air for combustion purposes admitted directly to or with the fuel. (2) Air introduced into a ventilation or air conditioning system from outside. (3) In an induction system, air supplied to the terminal units from a central plant [21].

Primary air pollutant: An air pollutant emitted directly from a source [*]. See also secondary air pollutant.

Probe: A tube used for sampling or for measuring pressures at a distance from the actual collection or measuring apparatus. It is commonly used for reaching inside stacks and ducts [22].

Prognosis: A forecast of the probable course and outcome of an attack of disease or the disease itself and the prospects of recovery, disability, or death as indicated by the nature of the disease and the symptoms of the case [12].

Psychosomatic: Pertaining to the interrelations of mind and body. Having bodily symptoms of psychic, emotional, or mental origin [12].

Psychrometer, sling (whirling): A hygrometer comprising wet- and dry-bulb thermometers that are mounted on a frame that can be rotated or whirled [17].

Public building: A functional classification term for buildings in public use characterized by a very high density of occupation and that may have a high level of physical activity and high levels of pollution (e.g., clubs, restaurants, large railway stations, museums, exhibition centers, public houses) [21].

Public health: The field that is concerned with safeguarding and improving the physical, mental, and social well being of the community as a whole [from 12]. The degree of decreased functioning of a population is measured as the accumulation of positive and negative contributions to the society of changed individual functioning. Includes direct measures of functioning like productivity, welfare costs, support of cultural continuation and development of the society, and continuation of the population. Indirect measures may also be considered like effects on society by affecting other individuals. [*]

Pulmonary: Pertaining to the lungs, or to the pulmonary artery [12].

Pulmonary edema: Fluid in the lungs [20].

Pulmonary function tests: Tests used to evaluate lung mechanics, gas exchange, pulmonary blood flow, and blood acid-base balance. Pulmonary function testing can be used to screen high-risk patients, such as cigarette smokers and workers exposed to industrial dusts, in order to detect pneumoconiosis, emphysema, bronchiectasis, pneumonitis, fibrosis, chronic obstructive bronchitis, etc. at an early stage. It is also used to evaluate patients in the diagnosis of pulmonary disease, assessment of disease development, or evaluation of the risk of pulmonary complications from surgery [from 12].

Pungency: Sensation elicited in the mucosa of the face (ocular, nasal, or oral) through chemical stimulation of free nerve endings from the trigeminal (cranial nerve V), which also carry thermal, tactile, and pain sensations. Includes sensations such as piquancy, tingling, prickling, irritation, stinging, burning and freshness [*].

Quality assurance (QA): An integrated system of activities involving planning, quality control, quality assessment, reporting and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence [19].

Quality control: The application of the theory of mathematical probability to sampling the output of a process, with the object of detecting and controlling any variations in quality [11].

Quality control sample: A sample matrix spiked with known amounts of analytes from a source independent from the calibration standards. It is generally used to establish intralaboratory or analyst specific precision and bias or to access the performance of all or a portion of the measurement system [19].

Quality of life: The degree of satisfaction an individual has regarding a particular style of life. Although assessment tools are available to evaluate physical and social dimensions, an individual's general sense of well being or satisfaction with the attributes of life is more difficult to evaluate [12].

Quantifiable limit: A concentration threshold above which a measured concentration can be assumed to be a reasonable estimate of the true value. The quantifiable limit is often taken to be three times the limit of detection. Values between the limit of detection and the quantifiable limit are often designated as "trace" values with no numerical estimate [*].

Questionnaire survey: Formulated series of questions to give an assessment condition, amount etc. of something that is interviewer- or self-administered to provide relevant information [from 30].

Radon (Rn): A naturally occurring radioactive gas, the immediate disintegration product of radium, chemically belonging to the inert gases. Atomic number 86, atomic weight 222, half-life of 3.8 days. Radon decays radioactively to polonium, lead, and bismuth isotopes (see radon progeny). Alpha particles emitted by the polonium isotopes create cell damage that can lead to lung cancer. [*]

Radon progeny, radon daughters: The short-lived decay products of radon 222, including polonium-218, lead-214, bismuth-214, and polonium-214 are solids and exist in air as free elemental particles or attached to dust particles. Nuclei produced when radon decays [*]:

Nucleus:	^{222}Rn	^{218}Po	^{214}Pb	^{214}Bi	^{214}Po	^{210}Pb	^{210}Bi	^{210}Po	^{206}Pb
Emits:	α	α	β	β	α	β	β	α	
Half-life:	4d	3 min	27 min	20 min	<1ms	21y	5d	138d	stable

Ranking: A method in which a series of three or more samples is presented at the same time and arranged in order of intensity or degree of some designated attribute [22].

Rash: A temporary eruption on the skin [12].

Rast: Radioallergosorbent test [12].

Rate of decay method: A method of measuring ventilation rate whereby a quantity of trace gas is released and the decrease in concentration measured as a function of time. Also known as the decay method and the tracer dilution method [21].

Receptor: (1) A molecule on the surface or within a cell that recognizes and binds with specific molecules, producing some effect in the cell; e.g., the cell-surface receptors of immunocompetent cells that recognize

antigens, complement components, or lymphokines, or those of neurons and target organs that recognize neurotransmitters or hormones. (2) A sensory nerve ending that responds to various stimuli [12].

Recirculated air: Old room air - removed by natural air flow or mechanical ventilation system, reintroduced into the rooms via heating and ventilating systems, cupboards, floor spaces, etc. One of the major possible sources of error in air infiltration measurements [21].

Reference concentration (RfC): An estimate of a continuous inhalation exposure for a given duration to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMCL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used. (Durations include acute, short-term, sub-chronic, and chronic and are defined individually below) [9]:

Acute Reference Concentration (RfC): An estimate of a continuous inhalation exposure for an acute duration (24 hours or less) to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMCL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used.

Chronic Reference Concentration (RfC): An estimate of a continuous inhalation exposure for a chronic duration (up to a lifetime) to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMCL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used.

Short-term Reference Concentration (RfC): An estimate of a continuous inhalation exposure for short-term duration (up to 30 days) to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMCL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used.

Sub-chronic Reference Concentration (RfC): An estimate of a continuous inhalation exposure for a sub-chronic duration (up to 10% of average lifespan) to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMCL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used.

Reference dose (RfD): An estimate of a daily oral exposure for a given duration to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMDL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used. (Durations include acute, short-term, sub-chronic, and chronic and are defined individually below) [9]:

Acute Reference Dose (RfD): An estimate of a daily oral exposure for an acute duration (24 hours or less) to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMDL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used.

Chronic Reference Dose (RfD): An estimate of a daily oral exposure for a chronic duration (up to a lifetime) to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMDL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used.

Short-term Reference Dose (RfD): An estimate of a daily oral exposure for a short-term duration (up to 30 days) to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMDL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used.

Sub-chronic Reference Dose (RfD): An estimate of a daily oral exposure for a sub-chronic duration (up to 10% of average lifespan) to the human population (including susceptible subgroups) that is likely to

be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMDL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used.

Reference material: A material of definite composition that closely resembles in chemical and physical nature the material with which the analyst expects to deal, and that is employed for calibration or standardization [22]. A material or substance, one or more properties of which are sufficiently well established to be used for the calibration of an apparatus, the assessment of a measurement method, or assigning values to materials [19].

Reference method: A sampling and/or measurement method that has been officially specified by an organization as meeting its data quality requirements [19].

Reflex: An involuntary reaction in response to a stimulus applied to the periphery and transmitted to the nervous centers in the brain or spinal cord [1].

Regulation: A rule prescribing a set of conditions and requirements that have been made mandatory for those under its control, by an exterior (administrative) authority [22].

Relative humidity: Hygrometric state of the atmosphere. Can be defined either as: (1) the ratio of the pressure of the water vapor actually present in the atmosphere to the pressure of the vapor which would be present if the vapor were saturated at the same temperature; or (2) the ratio of the mass of water vapor per unit volume of the air to the mass of water vapor per unit volume of saturated air at the same temperature. The numerical difference between the two is very small and can normally be neglected. The relative humidity is usually expressed as a percentage. Its value may be determined from knowledge of the dew point, since the saturated vapor pressure at the dew point is equal to the aqueous vapor pressure at the temperature of the experiment. The result is then obtained by reference to tables that give the saturated vapor pressure at different temperatures [11]. See also Humidity.

Relative humidity (RH): The ratio of the vapor pressure of water in the air to the saturation vapor pressure at the same pressure and dry bulb temperature [21]. See also Humidity.

Relative water vapor concentration: The ratio of the water concentration in the air to the concentration at saturation. (Also the ratio of the absolute humidities or specific humidities). The preferred quantity is the "relative humidity". The two terms have almost the same numerical value [21]. See also Humidity.

Relative ventilation efficiency: A quantity describing how the ventilation ability of a system varies between different parts of a room. [21].

Replicate: An adjective referring to more than one sample or to the performance of more than one analysis. Incorrectly used as a noun in place of replicate analysis. Replicate is to be used when referring to more than two items [19].

Replicate samples: Two or more samples representing the same population characteristic, time and place that are independently carried through all steps of the sampling and measurement process in an identical manner. Replicate samples are used to assess total (sampling and analysis) method variance. Often incorrectly used in place of the term "replicate analysis" [19].

Reservoir: (1) A storage place or cavity. (2) An alternate host or passive carrier of a pathogenic organism [12].

Residence time: The time during which a substance introduced into the air (or other medium) remains in place before it is lost or transformed into something else [21].

Residential building: A functional classification term for building. A general term for buildings whose primary purpose is to provide living space for the occupants. Activities within them are limited to those of a domestic

nature. This includes single-family, multi-family, communal, institutional, and intermittent-use building classifications [21].

Respirable particles: Particles that penetrate into and are deposited in the non-ciliated portion of the lung. Particles greater than 25 micrometers aerodynamic diameter are not considered respirable at all while particles less than 10 micrometers are considered respirable specifically into the tracheo-bronchial region, and those less than 2.5 micrometers are considered respirable into the alveolar portions of the lung[*]. Particles that can be inhaled by breathing [*].

Respiration: Aerobic respiration is the process by which living organisms, or their components, take oxygen from the atmosphere and give off carbon dioxide. Anaerobic respiration is the process by which organisms, or their components, obtain energy from chemically combined oxygen when they do not have access to free oxygen. Many organisms can respire anaerobically for a short time only, but certain bacteria depend entirely on anaerobic respiration [11].

Respiratory frequency: The number of breathing cycles per unit of time. Synonymous with breathing frequency [30]. The number of breaths in a period, normally one minute [*].

Respiratory irritation: Irritation of the upper or lower respiratory system [*].

Respiratory system: The breathing system, including the lungs and air passages (trachea or windpipe, larynx, mouth, and nose), as well as the associated system of nerves and circulatory supply [20].

Resuspension: Reintroduction of particulate matter from surfaces into the ambient air, by either wind or mechanical force [*].

Retention time: The time that elapses from the introduction of the sample until the component peak maximum is reached [22].

Rhinitis: Inflammation of the mucous membrane of the nose. It may be mild and chronic, or acute. Viruses, bacteria, and allergens are responsible for the varied manifestations of rhinitis. Often a viral rhinitis is complicated by a bacterial infection caused by streptococci, staphylococci, and pneumococci or other bacteria. Hay fever, an acute type of allergic rhinitis, is also subject to bacterial complications. Many factors assist the invasion of the mucous membranes by bacteria, including allergens, excessive dryness, exposure to dampness and cold, excessive inhalation of dust, and injury to the nasal cilia due to viral infection. In general, rhinitis is not serious, but some forms may be contagious. The mucous membrane of the nose becomes swollen and there is a nasal discharge. Some types are accompanied by fever, muscle aches, and general discomfort with sneezing and running eyes. Breathing through the nose may become difficult or impossible. Often rhinitis is accompanied by inflammation of the throat and sinuses. If bacterial infection develops, the nasal discharge is thick and contains pus. In acute rhinitis, the medical term for the common cold, the best treatment consists of rest, preferably in bed, a well-balanced diet, and sufficient fluids. Aspirin will relieve headache and fever. Chronic rhinitis may result in a permanent thickening of the nasal mucosa. Treatment is aimed at eliminating the primary cause of rhinitis and administration of decongestants to relieve nasal congestion [12].

Rhinitis, allergic, anaphylactic: Any allergic reaction of the nasal mucosa, occurring perennially (non-seasonal allergic rhinitis) or seasonally (hay fever) [12].

Rhinitis, atrophic: Chronic rhinitis with wasting of the mucous membrane and glands [12].

Risk assessment: Refers to the characterization of the types of health effects expected from exposure to a toxicant, estimation of the probability (risk) of occurrence of adverse effects, estimation of the number of cases, and a suggested acceptable concentration of a contaminant in air, water, or food [10].

Risk management: Identification, selection, information and implementation of risk management alternatives. Risk management is to intervene, usually based on a performed risk assessment. It means to prevent, reduce or modify exposures, to alter awareness, perception or valuation of risks [*].

Room: A space in a dwelling that is enclosed by walls to the ceiling and has doors and windows. A room is used, or is intended to be used, for habitation or for housing objects. Part of a building's space that is or might be occupied by persons or things, and has the ability to accommodate contents [*].

Routes of entry: To do bodily damage, a material must come in contact with the body. The method of bodily contact is called the route of entry. The routes of entry are absorption via eye or skin contact, ingestion, and inhalation [20].

Runs: Repeated measurements of the same kind on the same material or process [22].
Sample: A part of a population selected with the object of estimating some characteristic of the whole population. Can be random, stratified random, cluster random, or spot [from 13].

Sample size: The number of units in a sample or the number of observations in a sample [22]. Sample size calculations are performed to determine the number of samples necessary for hypothesis testing.

Sampler, personal: A device attached to a person that samples air in the immediate vicinity so that personal exposure to pollutants may be determined [13].

Sampling error: That part of the difference between a population value and an estimate thereof derived from a random sample, taking into account the size of the sample, which is due to the fact that only a limited number of all possible values is observed Sampling error is to be distinguished from errors due to imperfect selection, bias in response, errors of observation, measurement or recording, etc. [from 19].

Sampling, isokinetic: The taking of a sample of flowing gas (particularly gas flowing through a duct) in such a way that the sample does not undergo any change in either velocity or direction at the inlet of the probe. Used in taking samples of stack gases for measurement of their dust concentration [13].

Sampling plan: A procedure that specifies the number of units of product from a lot that is to be inspected, and the criteria for acceptability of the lot [22].

Saturated: (1) Denoting an organic compound that has only single bonds between carbon atoms. (2) Holding all of a solute that can be held in a solution by the solvent (saturated solution) [12].

Saturation: The condition existing when a vapor is in equilibrium with the plane surface of a condensed phase of the same substance (liquid or solid) [17].

Saturation vapor density/concentration: The vapor density at which a dynamic equilibrium exists for exchange of molecules between the gas and an open liquid surface [21].

Saturation vapor pressure: The vapor pressure at which a dynamic equilibrium exists for exchange of molecules between the gas and an open liquid surface. The pressure exerted by a vapor when saturated at a given temperature [21].

Saturation vapor pressure of water: The pressure of water vapor in equilibrium with a plane surface of liquid water. The saturation vapor pressure is a function of temperature [17].

Scenario (exposure): An environment, a set of causes, mechanisms, and effects that can be considered or investigated as if they are isolated from the rest of the world. It includes a population described by sensitivity and behavior causing the exposure, effects described by mechanisms and organs affected, and exposure intensity and type [*].

Scratch test: A test for hypersensitivity in which a minute amount of the substance in question is inserted in small scratches made in the skin. A positive reaction is swelling and reddening at the site within 30 minutes. Used in allergy testing and in testing for tuberculosis (Pirquet's reaction) [12]. (A prick test is often used instead; such a test doesn't actually penetrate through the skin.)

Secondary air pollutant: An air pollutant formed by chemical or physical change in the environment. See also primary pollutant [*].

Selectivity: (1) In general chemistry: The discrimination shown by a reagent in competitive attack on two or more substrates or on two or more positions in the same substrate. It is quantitatively expressed by ratios of rate constants of the competing reactions, or by the decadic logarithms of such ratios. [*] (2) In environmental toxicology: The characteristic of radiation, toxic chemicals or heavy metals (if ingested) to affect certain organs of the body to a much greater degree than the whole body dose would indicate [13]. (3) In pharmacology: the degree to which a dose of a drug produces the desired effect in relation to adverse effects [12]. (4) In analytical chemistry: The capability of a method or instrument to respond to a target substance or constituent in the presence of non-target substances [19].

Semi-volatile organic compounds (SVOCs): Organic compounds with boiling points in the range 240-260 to 380-400 °C with polar compounds in the higher range [33].

Sense: A faculty by which the conditions or properties of things are perceived. Hunger, thirst, malaise, and pain are varieties of sense; a sense of equilibrium or of well-being (euphoria) and other senses are also distinguished. The five major senses comprise vision, hearing, smell, taste, and touch [12].

Sensitization: (1) The initial exposure of an individual to a specific antigen, resulting in an immune response, subsequent exposure then inducing a much stronger immune response; said especially of such exposure resulting in a hypersensitivity reaction. (2) The coating of cells with antibody as a preparatory step in eliciting an immune reaction. (3) The preparation of a tissue or organ by one hormone so that is will respond functionally to the action of another [12].

Sensor: A device designed to respond to a physical stimulus (as temperature, illumination, and motion) and transmit a resulting signal for interpretation, or measurement, or for operating a control [18].

Sensory effects: Any changed perception of the environment or body function or any unconscious change of body function caused by environmental exposures [*].

Sensory panel: A group of individuals who may be selected on the basis of sensitivity to stimuli, reliability, or whose perceptions are judged to be representative of some larger population. Such groups are used to obtain information concerning the sensory attributes of physical stimuli [22].

Settling velocity: The terminal rate of fall of a particle through a fluid as induced by gravity or other external force; the rate at which frictional drag balances the accelerating force (or the external force) [*].

SI units: The units of measurements generally accepted for all scientific and technical uses. Together they make up the International System of Units. The abbreviation SI, from the French Systéme International d'UNités, is used in all languages. There are seven base SI units, defined by specified physical measurements and two supplementary units. Units are derived for any other physical quantities by multiplication and division of the base and supplementary units [12].

Sick: Not in good health; ill; afflicted with disease [12].

Sick Building Syndrome: 'Sick building' syndrome is a collection of complaints experienced by a significant number (more than 20 per cent) of building occupants who report illness perceived as being building-related. The complaints are characterized by a range of symptoms including, but not limited to eye, nose, and throat irritation, dryness of mucous membranes and skin, nosebleeds, skin rash, mental fatigue,

headache, cough, hoarseness, wheezing, nausea and dizziness. Introductions of new building materials, decreased ventilation and decreased air leakage have all contributed to the problem [from 13].

Side stream smoke: The emissions from the burning end of a cigarette, cigar, or pipe [31]. Cigarette smoke that has not passed through the cigarette or been inhaled [*]. See also ETS.

Silicosis: A lung disease caused by the prolonged inhalation of silica dust. In the past it was called such colorful names as potter's asthma, stonecutter's cough, miner's mold, and grinder's rot, according to the occupation in which it was acquired. Besides silicosis, various other lung diseases result from inhaling industrial substances; together, these "dust diseases" are called the pneumoconioses [12]. Silicosis increases the risk of tuberculosis and other respiratory conditions.

Sink: In atmospheric chemistry, an area or part of Earth and its atmosphere in which, or a process of which, one or more pollutants are removed from the air [2]. In indoor air science, a solid or liquid surface that absorbs or adsorbs an airborne pollutant. The sorption of the pollutant may be either permanent or temporary; in the latter case, the pollutant is subsequently re-emitted when environmental conditions change [*].

Sink effect: The absorption or adsorption of air pollutions by indoor materials, and subsequent retention by or re-emission from those materials [*]

Sinus: (1) A recess, cavity, or channel, as one in bone or a dilated channel for venous blood. (2) An abnormal channel or fistula, permitting escape of pus. In common usage, the word sinus refers to any of the eight cavities in the skull that are connected with the nasal cavity - the paranasal sinuses. The paranasal sinuses are arranged in four pairs, with members of each pair on the left and right sides of the head. The pairs are the maxillary sinuses, located in the maxillae; the frontal sinuses, in the frontal bone; the sphenoid sinuses, in the sphenoid bone behind the nasal cavity; and the ethmoid sinuses, in the ethmoid bone, behind and below the frontal sinuses [12].

Smell: The sense that enables one to perceive odors. The sense of smell depends on the stimulation of sense organs in the nose by small particles carried in inhaled air. It is important not only for the detection of odors, but also for the enjoyment of food. Flavor is a blend of taste and smell. Taste registers only four qualities of flavor depend on smell. The organs of smell are small patches of special (olfactory) cells in the nasal mucosa. One patch is located in each of the two main compartments of the back of the nose. The olfactory cells are connected to the brain by the first cranial (olfactory) nerve. Air currents do not flow directly over the patches in breathing; this is why one must sniff to detect a faint odor or to enjoy a fragrance to the fullest [12].

Smoke: Small gas-borne particles resulting from incomplete combustion, consisting predominantly of carbon and other combustible material, and present in sufficient quantity to be observable independently of the presence of other solids [18].

Smoking: The act of drawing into the mouth and puffing out the smoke of tobacco contained in a cigarette, cigar, or pipe [12].

Sorbent: A substance that absorbs or adsorbs, or both. [21].

Sorption: The action of soaking up or attracting substances; used in many pollution control processes [*].

Source: An indoor material, process, or activity that generates emissions of air pollutants, or contaminated outdoor air that enters a building [*].

Source characterization: Measurements of emissions from a source and subsequent evaluation or estimation of their possible health or comfort effects [*].

Source strength: Mass emission rate for a source of indoor air pollutants (e.g., mg of pollutant per hour) [*].

Span-drift: The change in the output of a continuous monitoring instrument over a stated time period during which the instrument is not recalibrated or adjusted [19].

Span-gas: A gas of known concentration that is used routinely to calibrate the output level of an analyzer [19].

Specific emission rate: An expression used parallel to emission factor specifying the emission in milligrams or micrograms per object/m^2 and unit time [*].

Specific humidity: The mass of water vapor present in one unit mass of moist air. [21].

Spirometer: An instrument for measuring air taken into and expelled from the lungs. The spirometer provides a relatively simple method for determining most of the lung volumes, capacities, and flows that are measured in pulmonary function tests [from 12].

Spore: (1) A refractory, oval body formed within bacteria, especially Bacillus and Clostridium, which is regarded as a resting stage during the life history of the cell, and is characterized by its resistance to environmental changes. (2) The reproductive element, produced sexually or asexually, of one of the lower organisms, such as protozoa, fungi, or algae [12].

Spot sample (grab sample): A sample of air, effluent, etc. collected over a short period of time and usually taken to a central laboratory for analysis [13].

Stack Effect: The pressure differential across a building caused by differences in the density of the air due to indoor-outdoor temperature differences [8].

Standards: Technical specifications or documents to the public, drawn up with the consensus or general approval of all interests affected by it based on the consolidated results of science, technology, and experience, aimed at the promotion of optimum community benefits and approved by a body recognized on the national, regional, or international level [2].

Standard atmosphere: See atmosphere, the normal or standard.

Standard conditions: Standard conditions of temperature and pressure (STP) refer to temperature of 0^o C or 273.5 K and pressure of 1 atm or 101.325 kPa [*].

Standard deviation: A measure, used in statistics, of the dispersion/scatter of a series of numbers or measurements about their mean value. Defined as the square root of the average value of the squares of the deviations from their mean value [from 11].

Standard method: An assemblage of techniques and procedures based on consensus or other criteria, often evaluated for its reliability by collaborative testing and receiving organizational approval [19].

Standard operating procedure: A written document that details the method of an operation, analysis, or action whose techniques and procedures are thoroughly prescribed and which is accepted as the method for performing certain routine or repetitive tasks [19].

Standard reference material: A certified reference material (e.g., produced by the U.S. National Institute of Standards and Technology) and characterized for absolute content independent of analytical method [19]. The equivalent ISO term is "certified reference material".

Standard solution: A solution containing a known concentration of analytes, prepared and verified by a prescribed method or procedure and used routinely in an analytical method [19].

Standard temperature and pressure: See standard conditions.

Stimulus: Any agent, act, or influence that produces functional or trophic reaction in a receptor or an irritable tissue [12].

Conditioned stimulus: A neutral object or event that is psychologically related to a naturally stimulating object or event and that causes a conditioned response [12].

Discrimitive stimulus: A stimulus associated with reinforcement, which exerts control over a particular form of behavior; the subject discriminates between closely related stimuli and responds positively only in the presence of that stimulus [12].

Eliciting stimulus: Any stimulus, conditioned or unconditioned, that elicits a response [12].

Structured stimulus: A well-organized and unambiguous stimulus, the perception of which is influenced to a greater extent by the characteristics of the stimulus than by those of the perceiver [12].

Threshold stimulus: A stimulus that is just strong enough to elicit a response [12].

Unconditioned stimulus: Any stimulus that is capable of eliciting an unconditioned response [12].

Unstructured stimulus: An unclear or ambiguous stimulus, the perception of which is influenced to a greater extent by the characteristics of the perceiver than by those of the stimulus [12].

Stinging Skin Test: A test of skin sensitivity to sensory irritation caused by exposures to pollutants. Solutions of standard sensory irritants are applied to the cheeks of the subjects and effects are rated subjectively [7].

Stock solution: A concentrated solution of analyte(s) or reagent(s) prepared and verified by prescribed procedure(s), and used for preparing work standards or standard solutions [19].

Stokes' law: A relationship for estimating the terminal fall velocity reached by a small sphere falling freely under gravity in a viscous medium. Stokes' law holds with fair accuracy for estimating settling velocities of spherical particles in air, provided the diameter of the particle does not exceed about 80 micrometers [from 32].

Stress (medical): The sum of the biological reactions to any adverse stimulus, physical, mental, or emotional, internal or external, that tends to disturb the homeostasis of an organism. Should these reactions be inappropriate, they may lead to disease states. The term is also used to refer to the stimuli that elicit the reactions [12].

Sub-acute effects: Biological change resulting from multiple or continuous exposures, usually occurring over about 21-90 days. Sometimes the term is used synonymously with sub-chronic effect and care should be taken to check the usage in any particular case [from 33].

Sub-chronic effects: Biological change resulting from repeated exposure over a short period, usually about 10% of the life span; an imprecise term used to describe exposures of intermediate duration [33]. Prolonged effect is another term used.

Subjective: Perceived only by the affected individual and not by the examiner [12].

Supply Air: Air delivered to a space for the purpose of ventilation, heating, cooling, humidification and dehumidification [8].

Supply Ventilation: A system in which air is supplied to a space to create an internal positive pressure. Air leaves the building through adventitious or purposely provided openings [8].

Susceptible: Readily affected or acted upon; lacking immunity or resistance [12].

Symptom: Any morbid phenomenon or departure from the normal in function, or sensation, experienced by the patient and indicative of disease [1]. Any indication of disease perceived by the patient [12]:

Cardinal symptoms: (1) Symptoms of greatest significance to the physician, establishing the identity of the illness. (2) The symptoms shown in the temperature, pulse, and respiration.

Dissociation symptom: Anesthesia to pain and to heat and cold, without impairment of tactile sensibility.

Objective symptom: One perceptible to others than the patients, as pallor, rapid pulse or respiration, restlessness, and the like.

Presenting symptom: The symptom or group of symptoms about which the patient complains or from which he seeks relief.
Signal symptom: A sensation, aura, or other subjective experience indicative of an impending epileptic or other seizure.
Subjective symptom: One perceptible only to the patients, as pain, pruritus, vertigo, and the like.
Withdrawal symptoms: Symptoms that follow sudden abstinence from a drug on which a person is dependent.

Syndrome: The aggregate of symptoms and signs associated with any morbid process, and constituting together the picture of the disease [1].

Synergism: A state in which the combined effect of two or more substances is greater than the sum of the separate effects (e.g., smoke and sulfur dioxides). It is the opposite of antagonism [13]. See also potentiation and additivity.

Systemic: Pertaining to or affecting the body as a whole [12].

Systemic agent: An agent that affects the body as a whole and not only a particular part or organ [from 13].

Systemic effect: Biological effects on one or more target organs caused by absorption and distribution of a toxic agent within the body [*].

Target organ effects: Chemically caused effects from exposure to a material on specifically listed organs and systems such as the liver, kidneys, nervous system, lungs, skin, and eyes [20].

Target population: A sub-population identified for study or for protection against a health effect, e.g., by regulation or recommendations. The target population is described by demographic variables like age, gender, race, and sensitivity that may be co-factors for the health effect considered [*].

Taste: The peculiar sensation caused by the contact of soluble substances with the tongue; the sense effected by the tongue, the gustatory and other nerves, and the gustatory center. The organs of taste are the taste buds, bundles of slender cells with hair-like branches that are packed together in groups that form the projections called papillae at various places on the tongue. When a substance is introduced into the mouth, its molecules enter the pores of the papillae and stimulate the taste buds directly. To do this, the substance has to be dissolved in liquid. If it is not liquid when it enters the mouth, then it melts or is chewed and becomes mixed with saliva.
There are four basic tastes: sweet, salt, sour, and bitter. Sometimes alkaline and metallic are also included as basic tastes. All other tastes are combinations of these. The taste buds are specialized, and each responds only to the kind of basic taste that is its specialty. The sweet and salt taste buds are most numerous on the tip and front part of the tongue, sour taste buds are mainly along the edges, and bitterness is tasted at the back of the tongue. Bittersweet substances are tasted in two stages: first sweet, then bitter. The solid center of the tongue's surface has very few taste buds. Other senses, including smell and touch, also play an important role in tasting [12].

Tear film stability: Average time (sec.) after an eye blink that the tear film stays intact [*].

Temperature: A property of an object that determines the direction of heat flow. When an object is placed in thermal contact with another object, heat flows from the higher temperature object to the lower temperature one [from 8].

Test Chamber: A vessel or enclosure, operated under controlled conditions that isolate a test specimen for determining emissions from indoor appliances, building materials, and products or responses of certain products to mixture of gases. Environmental test chambers, in general, are used for the evaluation of the responses of materials or products to chemical, thermodynamic, psychrometric, vibrational or radiation (ionizing/non-ionizing) stressors under conditions when all other potential influencing factors are kept constant. Chambers are characterized based on size and mode of operation. Among indoor test chambers, small chambers, sometimes called desktop or table-top chambers, generally have interior volumes of ~1 m^3 or less; medium-sized chambers

generally have interior volume of ~1 to 5 m^3; large chambers have interior volume ~5 to 15 m^3; and full-scale chambers, sometimes called room-sized chambers, have interior volume of 15 m^3 or more. Full-scale chambers are also used for eliciting responses of humans to different environmental conditions. For chambers operating in the static mode, fixed quantities of air or gases are initially introduced and then the chamber is sealed for the duration of the test. In a dynamic chamber test, gases or air are continually introduced at a rate sufficient to maintain target conditions for the duration of the test [*].

Thermal comfort: Thermal comfort denotes a condition that leads to satisfaction with the thermal environment and evokes a subjective satisfactory response about the thermal environment by 80% or more of its occupants [34].

Thermometer, globe: A thermometer with the sensing element enclosed in a 150 mm diameter globe, externally matt black, that enables mean radiant temperature to be measured [21].

Threshold: (1) The point at which a stimulus first produces a sensation. (2) The lower limit of perception of a stimulus. (3) The minimal stimulus that produces excitation of any structure; e.g., the minimal stimulus eliciting a motor response [1].

Threshold limit value: A limit of an environmental condition to which persons may be exposed repeatedly without adverse effect [21].

Threshold value: Limit below which a stimulus ceases to be perceptible [21].

Tidal volume: The amount of gas passing into and out of the lungs in each respiratory cycle [12].

Tight building syndrome: A collection of symptoms or complaints associated with reduced ventilation [*]. See also sick building syndrome.

Time lag: The time needed for an event or disruption to manifest itself. The time-lag effect often obscures the cause of the problem encountered and leads to treatment of the symptoms only [13].

Time-weighted average (TWA): Used in the control of occupational exposure to hazardous substances or harmful emissions such as noise or ionizing radiation. This is done by controlling the dose that the body is permitted to receive over a period of time. A long-term exposure limit (LTEL) is the sum of the concentrations averaged over 8 hours. If, say, for a compound this is 100 ppm, then exposure to a concentration of 200 ppm would only be permitted to 4 hours, which is the same as a TWA of 100 ppm for 8 hours, i.e., time-weighted. Note that there is often an STEL or short-term exposure limit (concentrations averaged over 10 min.) for chemical or radiation exposure. In the above example, if the STEL were 600 ppm then exposure to 400 ppm for 4 hours is permissible. If the STEL were 300 ppm it would not be allowed [13].

TLV: Threshold limit value. A term used by ACGIH to express the airborne concentration of a material to which nearly all workers can be exposed day after day without adverse effects. "Workers" means healthy individuals. The young, old, ill, or naturally susceptible will have lower tolerances and need to take additional precautions. ACGIH expresses TLVs in three ways: TLV-TWA, the allowable time-weighted average concentration for a normal 8-hour workday or 40-hour week; TLV-STEL, the short-term exposure limit or maximum concentration for a continuous exposure period of 15 minutes (with a maximum of four such periods per day, with at least 60 minutes between exposure periods, and provided that the daily TLV-TWA is not exceeded); TLV-C, the ceiling concentration that should not be exceeded at any time [20].

Total Volatile Organic Compounds (TVOC): An indicator of the minimum response in the form of perceived unspecific stimulation of nerves caused by a multi-component exposure of air pollutants at low levels. The value is calculated as the sum of concentrations of all VOCs in the air measured in mg/m^3 [*].

Total Volatile Organic Compound (TVOC) Air Concentration: The summed concentration of all the individual volatile organic compounds (VOCs) measured in an air sample by a precisely specified integrative or direct sampling method designed to detect all or most of the VOCs present [*].
Discussion: TVOC air concentrations can be estimated in two ways: The first method is based on summing the areas of all gas chromatographic peaks derived from standard test methods such as ASTM D 5466 or ASTM D 6196. Two similar ISO standards have recently been produced: ISO 16 000-6 which is more specific and ISO 16 000-3. The TVOC value so derived will depend on the type of sampler used, the collection and desorption efficiency of the sorbent trap, the efficiency of transfer to the gas chromatographic (GC) column, the type and size of the GC column, the GC temperature program and other chromatographic parameters, and the type of GC detector. The second method involves the use of direct-reading instruments that respond to all or most of the VOCs in the air sampled. The results of this method are limited by the fact that the technique evaluates the abundance of individual compounds in complex mixtures based on a reference compound such as toluene. A useful reference on TVOC may be found in Mølhave, L., Clausen, G., Berglund, B., De Ceaurriz, J., Kettrup, A., Lindvall, T., Maroni, A.C., Risse, U., Rothweiler, H., Seifert, B. and Younes, M. 1997. Total Organic Compounds (TVOC) in Indoor Air Quality Investigations, *Indoor Air*, 7:225-240.

Toxicity: The degree of danger posed by a substance to animal or plant life [*].

Toxicology: The study of the nature, effects, and detection of poisons in living organisms. Also, the study of substances that are otherwise harmless but prove toxic under particular conditions. The basic assumption of toxicology is that there is a relationship among the dose (amount), the concentration at the affected site, and the resulting effects [20].

Toxin: A poison, especially a protein or conjugated protein produced by certain animals, some higher plants, and pathogenic bacteria [12].

Trace elements: Elements that occur in minute quantities as natural constituents of living organisms and tissues. They are necessary for the maintenance of growth and development, but the shortage of any one may result in reduced growth, physiological troubles and eventually death. However, in large quantities they are generally harmful. Trace elements include copper, silicon, cobalt, iron, zinc, iodine and manganese [13].

Tracer: A material that can be easily identified and determined even at very low concentrations and that may be added to other substances to enable their movements to be followed or their presence to be detected [2].

Tracer gas: A gas used with a detection device to determine the rate of air interchange within a space, or between spaces [21].

Tracer gas dilution method: A method for measuring the movement of air between two points or spaces [from 21].

Trachea: The air passage extending from the throat and larynx to the main bronchi; called also the windpipe. This tube, about 20 mm wide and 100 mm long, is reinforced at the front and sides by a series of C-shaped rings of cartilage that keep the passage uniformly open. Strong fibroelastic membranes bridge the gaps between the rings. The trachea is lined with mucous membrane covered with small hair-like processes called cilia. These continuously sweep, forcing material out of the breathing passages toward the mouth. The process is retarded by cold but speeded by heat [12].

Trigeminal nerve: The fifth cranial nerve; it is composed of sensory and motor fibers, and has three decisions; ophthalmic, maxillary, and mandibular. The ophthalmic division supplies sensory fibers to the skin of the upper eyelid, side of the nose, forehead, and anterior half of the scalp. The maxillary division carries sensory impulses from the mucous membranes of the nose, the skin of the cheek and side of the forehead, and the upper lip and upper teeth. The mandibular division carries sensory impulses from the side of the head, chin, mucous membranes of the mouth, lower teeth, and anterior two-thirds of the tongue [12].

Turbulent Flow: Motion of fluids in which local velocities and pressures fluctuate irregularly or randomly [8].

Type I error, (alpha error): An (incorrect) decision resulting from the rejection of a true hypothesis (a false positive decision) [19].

Type II error, (beta error): An (incorrect) decision resulting from failure to reject a hypothesis that is false (a false negative decision) [19].

Ultraviolet (UV) radiation: Radiation for which the wavelengths of the monochromatic components are smaller than those for visible radiation, and more than about 1 nm. Note: The limits of the spectral range of ultraviolet radiation are not well defined and may vary according to the user. Committee E-2.1.2 of the CIE *[of ASTM]* distinguishes in the spectral range between 100 and 400 nm as follows: UV-A 315-400 nm; UV-B 280-315 nm; UV-C 100-280 nm. [22].

Uniform Mixing: See perfect mixing [8].

UVGI: Ultraviolet germicidal irradiation. An air disinfection technology that uses UV-C light of about 254 nm to inactivate microorganisms by damaging their nucleic acids and vital proteins [from 37].

Vapor: The gaseous form of substances that are normally in the solid or liquid state, and that can be changed to these states either by increasing the pressure or decreasing the temperature [22].

Vapor barrier: A moisture-impervious layer applied to the surfaces enclosing a space, or to the external surface of thermal insulation to limit moisture migration [21].

Vapor pressure: The pressure exerted by the vapor of a solid or liquid when in equilibrium with the solid or liquid [22].
Vapor pressure of moist air: The product of the mole fraction of water vapor and the total pressure at a specified temperature. If the moist air is assumed to behave in accordance with the ideal gas laws, then the vapor pressure is identically equal to the partial pressure of the water vapor in the moist air [17].

Ventilation: The process of supplying air to or removing air from a space for the purpose of controlling air contaminant levels, humidity, or temperature within the space [28].

Ventilation rate: The flow rate of air entering a room or building per unit time, or per occupant (e.g., m^3/h or L/s per person). The ventilation rate may be expressed in terms of outdoor air (fresh air) or total air supplied to the space. In the former case, it is usually referred to as outdoor (fresh) air ventilation rate [*].

Ventilation system: An ensemble of equipment used to ventilate a building. The same system of building equipment moves the air and cools, heats, filters and cleans the air. It is classified either by its function (ventilation, climate or combination) or distribution (centralized, decentralized or combined) or by method of airflow (either displacement or mixed air flow with variable or constant flow rates of air) [*].

Vertigo: A sensation of rotation or movement of one's self (subjective vertigo) in any plane. The term is sometimes used erroneously as a synonym for dizziness. Vertigo may result from diseases of the inner ear or may be due to disturbances of the vestibular centers or pathways in the central nervous system [12].

Vital capacity: The greatest volume of gas that, following maximum inspiration, can be expelled during a complete, slow, unforced expiratory maneuver; equal to inspiratory capacity plus expiratory reserve volume. Forced vital capacity (FVC) is the greatest volume of air that can be expelled when a person performs a rapid, forced expiratory maneuver. This usually takes a total of about five seconds. The greatest volume of air a person can exhale during one, two, three, or more seconds of forced expiration is called the forced expiratory volume (FEV). A subscript is added to the abbreviation FEV to indicate the phase during which the particular amount or volume of air is exhaled. A volume exhaled during the first second is designated $FEV_{1.0}$, a volume exhaled during the first two seconds is designated as $FEV_{2.0}$, and so on. The rate at which a specified volume of air is exhaled during a forced expiratory movement is called forced expiratory flow

(FEF). The rate at which air is exhaled from an FEV of 200 ml to an FEV of 1200 ml is designated $FEF_{200-1200}$ (formerly called maximal expiratory flow rate, MEFR); the rate from 25 to 75 per cent of FVC is designated $FEF_{25-75\%}$ (formerly called maximal mid-expiratory flow rate, MMFR). Laboratory values for vital capacity, FVC, FEV, and FEF are usually reported both as absolute values and as statistically derived predicted values based on the age, sex, and height of a patient. The statistical value is reported as a percentage [12]. See also pulmonary function tests.

Volatile: Passing readily into vapor; having a high vapor pressure [11].

Volatile Organic Compounds (VOCs): (1) Organic compounds with boiling points ranging from a lower limit between 50 ^{o}C and 100 ^{o}C, and an upper limit between 240 ^{o}C and 260 ^{o}C, where the upper limits represent mostly polar compounds [*].

Volatility: Measure of a material's tendency to vaporize or evaporate at ambient routine conditions [20].

Voluntary consensus standards: Standards formulated by consensus of expert volunteers. In the USA, the National Technology Transfer And Advancement Act (Public Law 104-113) mandates that Federal departments and agencies use voluntary consensus standards in place of Government standards wherever practical [35].

Wet and dry bulb hygrometer: An instrument for determining the relative humidity of the atmosphere. Consists of a pair of thermometers side by side, the bulb of one being surrounded by moistened muslin. This one will indicate a lower temperature than the other, on account of loss of heat by evaporation; the difference in the readings will depend upon the relative humidity, which can be found by reference to special tables calculated for the purpose [11]. See also psychrometer.

Wet bulb temperature: The temperature indicated by a wet bulb thermometer mounted in a sling or whirling psychrometer [21].

Wet- and dry-bulb thermometer: See psychrometer.

Wheeze: A whistling respiratory sound [12].

WHO definition of health: Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity [3].

Zone: A space or group of spaces within a building with heating or cooling requirements sufficiently similar that comfort conditions can be sustained by a single controlling device [26]. Note: a ventilation zone is not necessarily an independent thermal control zone; however, spaces that can be combined for thermal load calculations can often be combined into a single zone for ventilation calculations [28].

1. Stedman, T. L. (2000). Stedman's medical dictionary (27th ed.). Philadelphia: Lippincott Williams & Wilkins.

2. World Health Organization (1980). Glossary on Air Pollution. WHO, Regional Office for Europe, Regional publ. series no 9. Copenhagen, Denmark.

3. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1947.

4. Glossary of medical terms (2003). Ithaca, NY: Cornell University, Weill Medical College.

5. Glickman, T. S., & American Meteorological Society. (2000). Glossary of meteorology (2nd ed. / Todd S. Glickman, managing editor ed.). Boston, Mass: American Meteorological Society.

6. Fanger, P. O. (1988). Introduction of the olf and the decipol units to quantify air pollution perceived by humans indoors and outdoors. Energy and Buildings, 12, 1-6.

7. Mehnert, R., Cravedi, K. & National Library of Medicine (U.S.). (2003). Household products database. http://www.nlm.nih.gov/news/press%5Freleases/householdprod03.html

8. Air Infiltration and Ventilation Glossary. (1992). Technical Note AIVC 36. Bracknell, England: International Energy Agency, Air Infiltration Centre.

9. Integrated risk information system, glossary of IRIS terms. Retrieved 8/05, 2005 from http://epa.gov/iris/gloss8.htm

10. Hallenbeck, W. H., & Cunningham, K. M. (1986). Quantitative risk assessment for environmental and occupational health. USA: Lewis Publishers.

11. Uvarov, E. B., Chapman, D. R., & Isaacs, A. (1968). A dictionary of science. London: Penguin Reference Books.

12. O'Toole, M. T. (Ed.). (2003). Miller-Keane encyclopedia and dictionary of medicine, nursing and allied health (7th ed.). Philadelphia: Saunders/Elsevier Science.

13. Porteous, A. (1992). Dictionary of environmental science and technology. New York: John Wiley & Sons.

14. Berry, J.F. and M.S. Dennison. The Environmental Law and Compliance Handbook. McGraw-Hill, New York, 2000.

15. Standard terminology for statistical methods. (1985). ASTM standards on precision and bias for various applications (2nd ed.). Philadelphia: American Society for Testing and Materials.

16. Standard terminology for statistically related terms. (1985). ASTM standards on precision and bias for various applications (2nd ed.). Philadelphia: American Society for Testing and Materials.

17. Standard definitions of terms relating to humidity measurements. (1985). Atmospheric analyses; occupational health and safety. Philadelphia: American Society for Testing and Materials.

18. Standard definitions of terms relating to atmospheric sampling and analyses. (1979). Annual book of ASTM standards. Part 26, gaseous fuels; coal and coke; atmospheric analyses (1982 ed.). Philadelphia: American Society of Testing and Materials.

19. Guidance for quality assurance project plans: EPA QA/G-5(2002). No. EPA/240/R-02/009). Washington: U.S. Environmental Protection Agency.

20. Accrocco, J. O. (1990). The MSDS pocket dictionary : What does an MSDS mean? : Terms used on MSDSs. Schenectady, NY, USA: Published and distributed by Genium Pub. Corp.

21. AIRGLOSS: Air infiltration glossary (1981). Technical Note AIC#5. Bracknell, England: International Energy Agency, Air Infiltration Centre.

22. Compilation of ASTM standard definitions (1994). . Philadelphia: American Society of Testing and Materials.

23. Newman Dorland NA (Ed.). (1947). The American illustrated medical dictionary. Philadelphia: W.B. Saunders Co.

24. Guidance on choosing a sampling design for environmental data collection: EPA QA/G-5S(2002). No. EPA/240/R-02/005). Washington: U.S. Environmental Protection Agency.

25. [Number reserved for future reference.]

26. Terminology of heating, ventilation, air conditioning, and refrigeration (1986). Atlanta: American Society of Heating, Refrigerating and Air-conditioning Engineers.

27. Gatley, D. P. (2002). Understanding psychrometrics. Atlanta: American Society of Heating, Refrigerating and Air-conditioning Engineers.

28. ANSI/ASHRAE Standard 62.1-2004. (2004). Ventilation for Acceptable Indoor Air Quality. ISSN 1041-2336. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., Atlanta.

29. European standard prEN 12792 (draft, may 2002): Ventilation for buildings- symbols, terminology, and graphical symbols (2002). . Brussels: European Committee for Standardization (CEN).

30. Ozone and Your Patient's Health, Training for Health Care Providers: Glossary of Terms and Acronyms, U.S. Environmental Protection Agency. http://www.epa.gov/03healthtraining/glossary.html

31. Indoor Air Pollution: An Introduction for Health Professionals, 1994. http://www.epa.gov/iaq/pubs/hpguide.html

32. Glossary of Meteorology. Edited by Ralph E. Huschke. American Meteorological Society, Boston MA. 1970

33. Specialized Information Services of National Library of Medicine. National Institutes of Health Glossary of terms

34. ASHRAE 55-2004 and ISO 7730

35. http://xml.gov/efforts/nttaa.htm

36. [Number reserved for future reference.]

37. Nardell, E. A., Disinfecting Air, in Indoor Air Quality Handbook, chapter 11, 2000.

38. San Diego State University. Business and Financial Affairs, Environmental Health and Safety, Injury and Illness Prevention Program Glossary of Terms, 2005.

39. http://epa.gov/iaq/glossary.html

40. WHO (1989) Indoor air quality: organic pollutants. Report of a WHO meeting. EURO reports and studies no.111. World health organization, regional office for Europe, Copenhagen, Denmark.

41. WHO, EHC27, 1983

42. Air Quality Guidelines for Europe, 2nd edition, WHO Regional Office for Europe, 2000.

43. D.L. Davis (Ed.) Multi-chemical Sensitivities. Washington, D.C. National Academy Press, 1991.