

GLOSSARY

Laboratory employees should become familiar with the following terms and concepts. Many of these terms are commonly used in Material Safety Data Sheets (MSDSs). Some are also found in this Safety Manual.

ACGIH. American Conference of Governmental Industrial Hygienists. An organization of professionals in government agencies and educational institutions engaged in occupational safety and health programs.

aqueous. Describes a water-based solution or suspension. Frequently describes a gaseous compound dissolved in water.

anhydride. Any compound formed by the removal of the elements of water (hydrogen and oxygen).

anhydrous. "Without water". A substance in which no water molecules are present either in the form of a hydrate or as water of crystallization.

ANSI. American National Standards Institute. A privately funded, voluntary organization which develops and coordinates national consensus standards. Many ANSI standards relate to safe design/performance of equipment and safe practices or procedures. ANSI standards are widely recognized and accepted as "State of the Art" knowledge regarding acceptable safety practices.

asphyxia. The loss of consciousness as a result of too little oxygen and too much carbon dioxide in the blood.

asphyxiant. A vapor or gas that can cause unconsciousness or death by suffocation. Most *simple asphyxiants* are harmful to the body only when they become so concentrated that they reduce the available oxygen in the air (normally about 21 %) to dangerous levels (18 % or lower); e.g., CO₂, N₂, H₂ and He. Others are *chemical asphyxiants* like carbon monoxide (CO) or hydrogen cyanide (HCN) which reduce the blood's ability to carry oxygen.

autoignition temperature. The minimum temperature to which a substance must be heated without application of a flame or spark to cause that substance to ignite. Materials should not be heated to greater than 80% of this temperature.

base. A substance that can do at least one of the following: (1) liberate hydroxide anions (OH⁻) when dissolved in water, (2) receive a hydrogen ion from a strong acid to form a weaker acid, and/or (3) give up two electrons to an acid. Bases have a pH > 7 and turn litmus paper blue. They may be corrosive to human tissue and should be handled with care.

BCG. Bacilli of Calmette and Guerin. Vaccine used in some foreign countries to protect against TB infection. This vaccine is not used in the United States.

biodegradable. The capability of being readily decomposed by biological means, especially by microorganisms.

biomedical waste. Any solid or liquid waste which may present a threat of infection to humans.

biomedical waste disposal bags (red bags). These are the only approved biomedical waste disposal bags used at the University of Miami. All other types are illegal in the state of Florida. Supplies of these bags can be obtained from private distributors or through the Medical School Physical Plant stockroom.

Bloodborne Pathogens Policy and Procedures. The University's Exposure Control Plan, designed to eliminate or minimize occupational exposure of employees to bloodborne pathogens and other potentially infectious materials in compliance with OSHA's Bloodborne Pathogens Standard 29 CFR 1910.1030.

boiling point, BP. The temperature at which the vapor pressure of a liquid is equal to the surrounding atmospheric pressure so that the liquid becomes a vapor. Flammable materials with low BP's generally present special fire hazards. e.g., butane, BP = 31 °F; gasoline, BP = 100 °F.

btu. British thermal unit. The quantity of heat required to raise the temperature of 1 lb of H₂O by 1 °F at 39.2 °F, its temperature of maximum density.

buffer. A substance that reduces the change in hydrogen ion concentration (pH) that otherwise would be produced by adding acids or bases to a solution.

carcinogen. Substances that can cause cancer in humans or animals. A material is considered to be a carcinogen if (1) it has been evaluated and listed by the International Agency for Research on Cancer (IARC), (2) it is listed as a carcinogen or suspected carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP), (3) it is regulated by OSHA as a carcinogen, or (4) it meets the EPA criteria for a carcinogen or suspected carcinogen.

CAS Registration Number. Chemical Abstract Service registration number is the number assigned to identify a substance. CAS numbers identify *specific* chemicals and are assigned sequentially. The numbers have no chemical significance.

CFR. Code of Federal Regulations. The annual accumulation of executive agency regulations which contains the general body of regulatory laws governing practices and procedures performed by federal administrative groups.

combustible. A term used by NFPA, DOT, and others to classify, on the basis of flash point, certain liquids that will burn.

corrosive. A chemical that causes visible destruction or irreversible alterations in living tissue through chemical action at the site of contact.

cryogenic. Relating to extremely low temperature such as in refrigerated gases.

DEP. The Department of Environmental Protection of the State of Florida. A state agency with environmental protection, regulatory, and enforcement authority.

DERM. The Department of Environmental Resources Management of Miami-Dade County.

dermal toxicity. Adverse effects resulting from skin exposure to a material. Ordinarily used to denote effects on experimental animals.

DOT. U.S. Department Of Transportation. Regulates transportation of materials. DOT addresses issues in labeling, weight, classification of hazards, placarding of vehicles, etc. DOT regulations are intended to protect the public as well as fire rescue, EMTs and other emergency-response personnel.

Designated Area. A separate and distinct portion of a laboratory designed to deal with extremely hazardous chemicals and other substances which require special needs. The Designated Area must have the necessary engineering controls (fume hoods, biosafety cabinets, etc.) and the appropriate warning labels. Access must also be strictly controlled. A Standard Operating Procedure detailing the methods, responsible individuals, materials and handling of substances in the Designated Area must be completed by the Principal Investigator, and approved by EHS.

electrolyte. Any substance which in solution or in a liquid form is capable of conducting an electric current by the movement of its disassociated positive and negative ions to the electrodes.

EPA. U.S. Environmental Protection Agency. The federal agency with environmental protection, regulatory, and

enforcement authority.

evaporation rate. The rate at which a material will vaporize from the liquid or solid state. The evaporation rate can be useful in evaluating the health and fire hazards of a material.

exposure limits. The boundaries for quantities of chemicals to which employees can be exposed.

flammable. Describes any solid, liquid, vapor or gas that will readily catch fire and burn in air.

flash point. The lowest temperature at which a liquid has a sufficient vapor pressure to form an ignitable mixture with air near the surface of the liquid.

freezing point. The temperature at which a material changes its physical state from liquid to solid.

hazardous material. Any substance or mixture of substances having properties capable of producing adverse effects on the health or safety of a human. These substances also display the characteristics stated in 40 CFR 261.3, Subpart D, of ignitability, corrosivity, reactivity and EPA Toxicity or are listed in 40 CFR 261.31-33.

HBV. Hepatitis B Virus.

HCV. Hepatitis C Virus.

HEPA. Acronym for **H**igh-**E**fficiency **P**articulate **A**ir-purifying filter equipment, used for removing airborne materials. Often used for the removal of infectious microbes (e.g., TB) from the air.

HIV. Human Immunodeficiency Virus (the virus that causes AIDS).

IBC. Institutional Biosafety Committee. The body responsible for governing the use, transfer, and approval of recombinant DNA and regulated biohazardous agents.

immunocompromised. The state in which the immune system is deficient either because of disease or because it has been made so by the use of medications.

incompatible. Describes materials that can cause dangerous conditions when mixed together or stored in close proximity.

irritant. A non-corrosive material which causes a reversible inflammatory effect on living tissue at the site of contact. The severity of the reaction is a function of concentration and duration of exposure.

LEL. Lower Explosive Limit refers to the minimum concentration (by percent volume) of a fuel (vapor) in air at which a flame is propagated when an ignition source is present.

M. tuberculosis. *Mycobacterium tuberculosis*. The agent responsible for TB infection. All employees with a reasonably anticipated exposure to TB must comply with the University's Tuberculosis Infection Control Policy. The parameters for being "reasonably anticipated" include (1) having contact with patients on a routine basis, (2) working in areas where the ventilation is shared with patient areas or (3) working with human subjects from high prevalence groups in research or clinical trials.

melting point. The temperature at which a solid changes to liquid.

MSDS. Material Safety Data Sheet. These sheets contain descriptive safety information concerning the use and handling of chemicals. OSHA has established guidelines for these forms (OSHA form 174) and requires those who produce, distribute, and use hazardous materials to make the MSDS available to their employees.

mutagen. A material that induces genetic changes (mutations) in the DNA of chromosomes.

NFPA. **National Fire Protection Association.** A national organization with the purpose of establishing programs, standards and safeguards against loss of life and property by fire. The NFPA develops the National Fire Codes which are the laws that govern fire prevention and protection.

NIOSH. **National Institute of Occupational Safety and Health.** The agency of the Public Health Service that tests and certifies respiratory and air sampling devices. It recommends exposure limits for substances and assists OSHA in investigations and research.

odor threshold. The lowest concentration of a gas in air that can be detected by smell.

OSHA. The **O**ccupational **S**afety and **H**ealth **A**dministration. Part of the U.S. Department of Labor. The regulatory and enforcement agency responsible for safety and health in most U.S. industrial sectors.

oxidation. A reaction in which a substance combines with oxygen provided by an oxidizer or oxidizing agent. Also the process by which electrons are removed from atoms or ions.

oxidizer. A substance that yields oxygen readily to stimulate the combustion (oxidation) of organic matter.

pH. The value that represents the acidity or alkalinity of an aqueous solution. The number represents the base 10 logarithm of the reciprocal of the hydrogen ion concentration of a solution.

physical state. The condition of a material; i.e., solid, liquid, or gas, at a given temperature.

PPD. Protein Purified Derivative. A tuberculin test method used to evaluate the likelihood that a person is infected with *M. tuberculosis*.

Post Exposure Prophylaxis. Medications used to attempt to prevent conversion to HIV positive after exposure to HIV positive blood or body fluids.

reducing agent. A chemical or substance that (1) has oxygen removed or (2) gains electrons from an oxidation-reduction reaction.

REL. **R**ecommended **E**xposure **L**imit. The NIOSH, REL, is the highest allowable airborne concentration that is not expected to injure a worker. It may be expressed as a ceiling limit or as a time-weighted average (usually for 8-hr work shifts).

sensitizer. A material to which there is little or no physiological response on first exposure in humans or test animals. However, repeated exposures may cause a marked response not necessarily limited to the contact site. The skin and respiratory tract are the most commonly affected areas in the body by chemical sensitizers.

sharps container. A rigid, puncture-resistant container designed primarily for containment of sharps. Unless the container is already red, it should be placed in a red bag for disposal. All sharps containers must be approved by EHS.

Standard Operating Procedure (SOP). Procedures which outline the methods, responsible individuals, materials and handling of hazardous and toxic substances in a specialized area in the laboratory. An SOP is specifically required when using extremely hazardous chemicals and/or some types of infectious agents.

specific gravity. The ratio of the mass of a body to the mass of an equal volume of water at 4°C or other specified temperature.

target organs. Organs within the body which are specifically affected by different types of chemicals. The most

common of these include the liver, kidneys, nervous system, skin, and eyes.

TB. See **M. tuberculosis**.

TC_{Lo}. **Toxic Concentration Low.** The lowest concentration of a substance in air to which humans or animals have been exposed for any given period of time that has produced (1) toxicity, (2) tumorigenesis, or (3) reproductive changes.

TLV. **Threshold Limit Value.** A term used by ACGIH to express the daily exposure limit for workers to the airborne concentrations of specified materials without adverse effects. ACGIH expresses TLV's in three ways: (1) **TLV-TWA**, the allowable **Time-Weighted Average** concentration for a normal 8-hour workday or 40-hour week; (2) **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, and provided that daily TLV-TWA is not exceeded); and (3) **TLV-C**, **Ceiling**, the concentration that should not be exceeded at any time.

toxic. Describes the ability of a material to injure biological tissue.

UEL. **Upper Explosive Limit** refers to the highest concentration (by percent volume) of a fuel (vapor) in air at which a flame is propagated when an ignition source is present.

Standard Precautions. The treatment of all human blood and certain human body fluids as if they are known to be infectious for HIV, HBV, and other bloodborne pathogens. Formerly known as Universal Precautions.

vapor pressure. The pressure at any given temperature of a vapor in equilibrium with its solid or liquid form. Vapor pressures are useful (with evaporation rates) to determine how quickly a material becomes airborne and thus how quickly a worker can be exposed to it.

volatility. Measure of a material's tendency to vaporize or evaporate at ambient conditions.

water reactivity. Ability of a material to react with water and release a gas that is either flammable or presents a health hazard.