Environmental Health and Safety
The University of Texas at Austin
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Hazardous Chemical Inventory Worksheet
—Laboratories Only—

All fields must be filled in! No fields can remain blank!

Facility/Contact Information

Location Information

On the Data Entry Form, a drop-down list of the three letter abbreviations for the buildings will appear in the field for "**Building**." Please choose your building from the drop-down list. Notify EH&S at 1-6399 if your building code does not appear in this list.

Building: _____

The field "**Room**" is where you enter the University assigned room number for the lab.

> Inner rooms of labs that have their own University assigned room numbers must have separate chemical inventories. The inventory for the inner room must be placed at or near the door to the inner room, with a provided copy also posted at the main entrance. For example, if a lab numbered 114 has an inner room numbered 114A, then an inventory is needed for 114 and 114A. Both inventories should only include information about the materials stored in that room; do not combine all materials onto one chemical inventory.

Room: _____

Principal Investigator

The name that should appear in the "**Principal Investigator/Faculty Name**" field is that of the faculty member who is ultimately responsible for the lab. No graduate student or postdoctoral names should be entered here. Be sure to enter first name, then last name, making sure to correctly spell both.

Principal Investigator/Faculty Name: First: _____ Last: _____

Emergency Contacts

The fields for "**Primary Contact**" and "**Secondary Contact**" cannot be left blank! The labs must assign a primary and secondary contact to be used in case of emergency. The primary contact should be the person most familiar with the lab. This person would be the first to be contacted in case of emergency. The secondary contact will be called only if the primary contact is unavailable. **It is extremely important not only to assign a primary and secondary contact, but also to fill in the office and home numbers for both.**

Primary Contact: First Name: _____ Last Name: _____
Office Phone: _____ Home Phone: _____

Secondary Contact: First Name: _____ Last Name: _____
Office Phone: _____ Home Phone: _____

Hazardous Material Information

On the inventory, please indicate both the **typical quantities** (**TQ**) and **maximum quantities** (**MQ**) for each of the following types of materials that are stored in your laboratory. Please specify quantities only in the units indicated. An approximate conversion from metric units is acceptable (e.g., 4 liters = 1 gallon). Please call Nena Anderson at 471-2044 with any questions regarding completion of the chemical portion of the inventory form.

For more information about the physical and health hazards of specific chemicals, you can use the online MSDS references available on the Environmental Health & Safety web page.

If a chemical falls into more than one category, the following hierarchy should be used to determine the one category under which to list the chemical:

1. Explosive
2. Water reactive
3. Pyrophoric
4. Flammable
5. Highly toxic
6. Oxidizer
7. Organic peroxide
8. Combustible
9. Corrosive

For example, nitric acid is both corrosive and an oxidizer. As indicated in this hierarchy, it should be listed as an oxidizer. Acetic acid is flammable and corrosive. It should be reported as a flammable. Most alkali metals are stored in flammable liquids, but many of them should be counted as water reactives.

Explosives

Materials that may cause a sudden, almost instantaneous release of pressure, gas, and/or heat when subjected to sudden shock, pressure, or elevated temperatures. Examples include dry picric acid, nitroglycerin, lead azide, 2,4-dinitrophenylhydrazine, peracetic acid, sodium acetylide, mercury fulminate, nitrogen triiodide, diazomethane, and ruthenium perchlorate.

Typical Quantity: _____ pounds
Maximum Quantity: _____ pounds

Water Reactive Materials

Materials which either explode, violently react, evolve flammable, toxic, or otherwise hazardous gases, or evolve enough heat to cause self-ignition or ignition of nearby combustibles upon exposure to water or moisture. Examples include lithium aluminum hydride, calcium phosphide, sodium borohydride, phosphorus pentasulfide, and pure alkali metals.

Typical Quantity: _____ pounds
Maximum Quantity: _____ pounds

Pyrophoric Materials

Materials that will spontaneously ignite in air at or below a temperature of 130°F (54.4°C). Examples include organomagnesiums, methyl phosphorous dichloride, dimethylzinc, organolithiums, and diethyl chlorophosphite.

Typical Quantity: _____ pounds
Maximum Quantity: _____ pounds

Flammable Solids

Materials that do not meet the definition of explosives that are prone to cause fire through friction or some other physical means, that have an ignition temperature below 212°F (100°C), or which burn so vigorously and/or persistently when ignited that they create a considerable hazard. Flammable solids include finely divided solid materials which when dispersed in air as a cloud may be ignited, thereby causing an explosion. Examples include powdered magnesium, phosphorus trisulfide, palladium on carbon, white phosphorus, and nitrocellulose.

Typical Quantity: _____ pounds
Maximum Quantity: _____ pounds

Flammable Liquids

Flammable liquids are those liquids having a flash point below 100°F (37.8°C) at atmospheric pressure and having a vapor pressure not exceeding 40 psi (2.72 atmospheres) at room temperature. Examples of flammable liquids that are miscible with water include isopropyl alcohol, isopropylamine, methanol, p-dioxane, acetonitrile, acetone, and acetaldehyde. Examples of flammable liquids that are water-insoluble (i.e., not miscible with water) include carbon disulfide, n-hexane, benzene diethyl ether, and methyl ethyl ketone.

Please inventory water-miscible and water-insoluble flammable liquids separately.

I. Miscible in water
Typical Quantity: _____ gallons
Maximum Quantity: _____ gallons

II. Water-insoluble
Typical Quantity: _____ gallons
Maximum Quantity: _____ gallons

Highly Toxic Materials

Materials that pose an unusual hazard or risk due either to the fact that they are lethal or acutely toxic at relatively low concentrations in any one of the following categories:

1.A rat oral LD_{50} of 50 milligrams of substance per kilogram of body weight or less (ORL-RAT LD_{50})
2.A rabbit contact LD_{50} of 200 milligrams of substance per kilogram of body weight or less (SKN-RBT)
3.A rat inhalation LC_{50} of 200 ppm by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust when administered by continuous inhalation for one hour (IHL-RAT).

Examples include ricin, strychnine, aniline, aconitine, and potassium cyanide.

The LD_{50} and LC_{50} of a substance can be found in its MSDS under the Toxicological section.

Typical Quantity: _____ pounds
Maximum Quantity: _____ pounds

Oxidizers

Materials that do not meet the definition of explosives that either initiate or promote combustion in other materials, thereby causing fire either of themselves or through the release of oxygen and/or other gases. Examples include red fuming nitric acid, potassium permanganate, chromium trioxide, hydrogen peroxide, potassium persulfate, and sodium chlorate.

Typical Quantity: _____ pounds
Maximum Quantity: _____ pounds

Organic Peroxides

Organic compounds that contain either a peroxide (R_1OOR_2) or a hydroperoxide (ROOH) functionality in their molecular structure. Examples include peroxyacetic acid, cumene hydroperoxide, and benzoyl peroxide.

Typical Quantity: _____ pounds
Maximum Quantity: _____ pounds

Combustible Liquids

Combustible liquids are those liquids having a flash point between 100°F (37.8°C) and 200°F (93.3°C) at atmospheric pressure. Examples of combustible liquids that are miscible with water include dimethyl formamide, dimethyl sulfoxide, and diglyme (diethylene glycol dimethyl ether). Examples of combustible liquids that are water-insoluble include cyclohexanone, aniline, n-pentanol, and benzyl chloride.

Please inventory water-miscible and water-insoluble combustible liquids separately.

I. Miscible in water
Typical Quantity: _____ gallons
Maximum Quantity: _____ gallons

II. Water-insoluble
Typical Quantity: _____ gallons
Maximum Quantity: _____ gallons

Corrosive Materials

Typical liquid acids and bases. Examples of acids include hydrochloric acid and sulfuric acid. Examples of bases include ammonium hydroxide and aqueous sodium hydroxide.

Please inventory acids and bases separately.
Notice that corrosives must be reported in pounds. To convert from liters to pounds, multiply the amount in liters by the specific gravity of the substance given in grams per milliliter, then multiply that number by 2.2. Thus, 2.5 liters of hydrochloric acid, which has a specific gravity of 1.2 g/ml, weighs 6.6 pounds. The specific gravity of a substance can be found in its MSDS under the Physical and Chemical Properties section.

Typical Quantity: _____ pounds ACID
Maximum Quantity: _____ pounds ACID

Typical Quantity: _____ pounds BASE
Maximum Quantity: _____ pounds BASE

Cryogenic Fluids

Fluids that have a normal boiling point below -150°F (-65.6°C) at atmospheric pressure. Examples include liquid helium and liquid nitrogen.

Typical Quantity: _____ pounds
Maximum Quantity: _____ pounds

Radioactive Materials

Materials which spontaneously emit ionizing radiation. Examples include ^{14}C, ^{235}U, and ^{3}H compounds.

Simply denote whether or not materials of this nature are present in the lab by selecting either Yes or No.

Yes No

Pathogenic Materials

Human blood or any bacterial, fungal, parasitic, rickettsial, or viral disease causing agent.

Simply denote whether or not materials of this nature are present in the lab by selecting either Yes or No.

Yes No

Compressed Gases

Note: Do not enter the number of gas cylinders in this field. You must enter the volume of gas in cubic feet.

Any material or mixture that, when enclosed in a container, has an absolute pressure exceeding 40 psi at 70•F (21.1°C) or, regardless of the pressure at 70°F, has an absolute pressure greater than 140 psi at 130°F (54.4°C). Examples include ethylene oxide, carbon dioxide, and acetylene.

This inventory is intended to address only **three specific types** of compressed gases: **flammable gases** (i.e. materials that ignite either spontaneously or upon exposure to some energy source when released from their container), **gases which pose a significant threat to human health** (i.e. materials which are poisonous and/or have a destructive effect on human tissue), and **reactive gases** (i.e. materials which are oxidizers and/or materials which undergo violent reaction, such as decomposition or polymerization, when

released from their container). For the purposes of this inventory each gas should be inventoried in one category only. In order to assign the appropriate type for each gas, determine all of the hazard characteristics for a particular gas and assign the highest priority hazard characteristic as the type for that gas. In order of decreasing priority, the three types of compressed gases to be inventoried are:

1. Flammable gases
2. Gases which pose a significant threat to human health
3. Reactive gases

Examples:

1. Phosphine - This gas is flammable and poisonous. Considering the aforementioned prioritization scheme, this gas would only be inventoried as a flammable-type gas.
2. Bromine Chloride - This gas is poisonous, corrosive, and an oxidizer. It would only be inventoried as a gas, which poses a significant threat to human health.

Once the hazard type for each gas is determined, report the aggregate quantity of each type of gas.

I. Flammable
Typical Quantity: _____ cu. ft. @ STP
Maximum Quantity: _____ cu. ft. @ STP

II. Health Threat
Typical Quantity: _____ cu. ft. @ STP
Maximum Quantity: _____ cu. ft. @ STP

III. Reactive
Typical Quantity: _____ cu. ft. @ STP
Maximum Quantity: _____ cu. ft. @ STP

Note: To convert from pounds per square inch, as read on the gauge, to cubic feet, two measurements of the cylinder must be made. Measure the diameter in feet and the height (h) in feet of the cylinder. Divide the diameter by two to get the radius (r). Then use the following formula where P is the gauge pressure of the cylinder (when full for maximum quantity).

$$\text{Volume} = \frac{P * 3.14 * r^2 * h}{14.7}$$

Thus for a cylinder that is 1 foot in diameter and 4 feet high that has a gauge pressure of 950 psi, the volume in cubic feet is:

$$\frac{950 * 3.14 * 0.52^2 * 4}{14.7} = 203 \text{ cubic feet}$$

Examples of Compressed Gas Hazards

Compressed Gas	Hazard Characteristic
Acetylene	Flammable
Air	None
Allene	Flammable
Ammonia	Reactive
Argon	None
Arsine	Health Threat
Arsenic Pentafluoride	Reactive
Boron Trichloride	Reactive
Boron Trifluoride	Health Threat
Bromine Pentafluoride	Health Threat
Bromine Trifluoride	Health Threat
Bromoacetone	Health Threat
Bromotrifluoroethylene	Health Threat
Bromotrifluoromethane	Health Threat
1,3,-Butadiene	Flammable
Butane	Flammable
1-Butene	Flammable
2-Butene	Flammable
Carbon Dioxide	None
Carbon Monoxide	Flammable
Carbonyl Fluoride	Health Threat
Carbonyl Sulfide	Flammable
Chlorine	Health Threat
Chlorine Pentafluoride	Health Threat
Chlorine Trifluoride	Health Threat
Chlorodifluoroethane	Flammable
Chlorodifluoromethane	None
Chlorofluoromethane	None
Chloroheptafluorocyclobutane	Health Threat
Chloropentafluoroethane	None
1-Chloro-1,2,2,2-Tetrafluoroethane	None
1-Chloro-2,2,2-Trifluoroehtane	None
Chlorotrifluoroethylene	None
Chlorotrifluoromethane	None
Cyanogen	Health Threat
Cyanogen Chloride	Health Threat
Cyclopropane	Flammable
Deuterium	Flammable
Deuterium Chloride	Health Threat
Deuterium Fluoride	Health Threat
Deuterium Selenide	Health Threat
Deuterium Sulfide	Flammable
Diborane	Flammable
Dichlordifluoromethane	None
1,2-Dichlorohexafluorocyclobutane	Health Threat
Dichlorosilane	Flammable
1,1-Dichlortetrafluoroethane	None

2,2-Dichloro-1,1,1-Trifluoroethane	None
Diethylzinc	Flammable
1,1-Difluoroehtane	Flammable
1,1-Difluororethylene	Flammable
Dimethylamine	Flammable
Dimethyl Ether	Flammable
Dimethyl Silane	Flammable
2,2-Dimethylpropane	Flammable
Diphosgene	Health Threat
Ethane	Flammable
Ethylacetylene	Flammable
Ethylamine	Flammable
Ethyl Chloride	Flammable
Ethyldichloroarsine	Health Threat
Ethylene	Flammable
Ethylene Oxide	Flammable
Ethyl Fluoride	Flammable
Fluroine	Health Threat
Germane	Heath Threat
Helium	None
Heptafluorobutyronitrile	Health Threat
Hexafluoroacetone	Health Threat
Hexafluorocyclobutene	Health Threat
Hexafluoroethane	None
Hexafluoropropylene	None
Hydrogen	Flammable
Hydrogen Bromide	Health Threat
Hydrogen Chloride	Health Threat
Hydrogen Cyanide	Flammable
Hydrogen Iodide	Health Threat
Hydorgen Selenide	Health Threat
Hydorgen Sulfide	Flammable
Iodine Pentafluoride	Health Threat
Isobutane	Flammable
Isobutylene	Flammable
Krypton	None
Lewsite (?-chlorovinyldichloroarsine)	Health Threat
Methane	Flammable
Methylacetylene	Flammable
Methyl Bromide	Flammable
3-Methyl-1-butene	Flammable
Methyl Chloride	Flammable
Methyldichloroarsine	Health Threat
Methyl Fluoride	Flammable
Methylene Fluoride	None
Methanethiol	Flammable
Methylsilane	Flammable
Methylanime	Flammable
Natural Gas	Flammable
Neon	None

Nickel Carbonyl	Flammable
Nitirc Oxide	Health Threat
Nitrogen	None
Nitrogen Dioxie	Health Threat
Nitrogen Trifluoride	Health Threat
Nitrogen Trioxide	Health Threat
Nitrosyl Chloride	Health Threat
Nitrosyl Fluoride	Health Threat
Nitrous Oxide	None
Nitryl Fluoride	Health Threat
Octafluorocyclobutane	None
Octafluoropropane	None
Oxygen	Health Threat
Oxygen Difluoride	Health Threat
Pentaborane	Flammable
Pentafluoropropionitrile	Health Threat
Perchloryl Fluoride	Health Threat
Perfluorobutane	None
Perfluro-2-butene	None
Phenylcarbylamine Chloride	Health Threat
Phosgene	Health Threat
Phosphine	Flammable
Phosphorous Pentafluoride	Health Threat
Phosphorous Trifluoride	Health Threat
Propane	Flammable
Propylene	Flammable
Silane	Flammable
Silicon Tetrafluoride	Health Threat
Stibine (Antimony Hydride)	Health Threat
SulfurDioxide	Health Threat
Sulfur Hexafluoride	Health Threat
Sulfuryl Fluoride	Health Threat
Tetrafluorethylene	Flammable
Tetrafluorohydrazine	Health Threat
Tetrafluoromethane	Health Threat
Tetramethyl Lead	Flammable
Triethylaluminum	Flammable
Triethylborane	Flammable
Trifluoroacetonitile	Health Threat
Trifluoroacetyl Chloride	Health Threat
1,1,1-Trifluoroethane	Flammable
Trifluoromethane	None
Trifluoromethyl Hypofluorite	Health Threat
Trifluoromethyl Iodide	Health Threat
Trimethylstibine	Health Threat
Vinyl Chloride	Flammable
Vinyl Fluoride	Flammable
Vinyl Methyl Ether	Flammable
Xenon	None

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