

# Chemical Inventory Worksheet Template

School Name \_\_\_\_\_

Date \_\_\_\_\_

Contact Name \_\_\_\_\_

Storage Room No. \_\_\_\_\_

Phone Number \_\_\_\_\_

MSDS<sup>1</sup>/SDS<sup>2,3</sup> Location \_\_\_\_\_

Chemical Name	Receipt Date	Expiration Date (Per Label)	Number of Containers	Total Amount	Container Type	Manufacturer	Color Coding <sup>4</sup> Chemical Storage*		Chemical Storage Per Flinn**		Notes or Comments
							Location	Color	Storage Code Page 2	GHS Chemical Hazards Classification <sup>5</sup> Page 3	

There are two chemical storage systems \* and \*\* listed in the table. Only one system should be used as your preference.

# Summary for Codings, Acronyms, Units and Definitions Used in the Table

## Definitions of Units and Notes in the Table

The units listed are as marked on the container. The quantity should be estimated if it was used: ml = milliliter; gal = gallon; lb = pound; fl oz = fluid ounce; oz = ounce, L = liter; qt = quart; g = gram; kg = kilogram

In the "**Container Type**" column, P = Plastic; G = Glass; M = Metal

In the "**Color Coding Chemical Storage**" column, the colors will be determined by its hazard classification and Safety Data Sheet (SDS) information.

In the "**Chemical Storage Per Flinn, Storage Code**" column, I = Inorganic; O = Organic; Mis = Miscellaneous. Check "Chemical Storage and Handling Recommendations" in a separate document on this website for the details.

In the "**GHS Chemical Hazards Classification**<sup>5</sup>" column, Roman numbers combine with GHS Classification for Chemical Hazard is used. See the details in page 3.

One chemical may require multiple storage color codes and have multiple hazard characteristics. The highest hazardous code and highest toxicity category should be selected in the table.

## Color Coding Chemical Storage

Blue (Health Hazard-Toxic): Chemical is hazardous to health if ingested, inhaled or absorbed through the skin. Store separately in a secure area

Red, Red Stripe (Flammable): Store separately only with other flammable chemicals

Green (General Storage): Reagent presents no more than a moderate hazard in any categories. General chemical storage

Yellow (Oxidizer-Reactive): Reactive/Oxidizer. May react violently with water, air or other chemicals. Store separate from combustible/flammable reagents

White, White Stripe (Corrosives): May be harmful to eyes, mucous membranes and skin. Store separate from combustible and flammable chemicals

## **Globally Harmonized System (GHS) Classification Combined with Roman Numbers for Chemical Hazards**

**This modified chemicals classification is based on Environmental Health & Safety Assistant (EHSA's) online "chemical inventory worksheet instruction"<sup>6</sup> and GHS. Roman numbers were used for identifying six different hazardous categories and numerical numbers 1 to 5 follow Roman numbers to indicate the hazardous levels for a chemical (1 is for most severe and 5 is least severe)**

I: Fire Hazard - includes products which are *flammable, combustible liquid, pyrophoric, and/or an oxidizer*

II: Pressure Hazard - includes products which are *explosive or compressed gases*

III: Reactivity Hazard - include products which are *unstable reactives, organic peroxides, and/or water reactive*

IV: Acute Health Hazards (immediate) - includes products which are *highly toxic, corrosive, toxic, irritants, sensitizers*, and other hazardous chemicals which cause an *adverse effect to a target organ within a short period of time*

V: Chronic Health Hazards (delayed) - includes products which are *carcinogens, mutagens, or teratogens*, and other hazardous chemicals which cause an *adverse effect to a target organ after a long period of time*

VI: Environmental Hazards\*\*\* - is the state of events which has the potential to threaten the surrounding natural environment and adversely affect people's health

\*\*\* This definition is from Wikipedia.

**GHS classification should be used to be in compliance with OSHA's regulation: June 1, 2015 - Chemical manufacturers and distributors must complete hazard reclassification and produce GHS styled labels and safety data sheets. Distributors get an additional 6 months to complete shipments of old inventory<sup>7</sup>. All new purchased chemicals will have GHS required labeling and hazard classification.**

## Dangerous Chemicals Potentially Found In High School Chemical Storage Room

Chemicals Name	Toxicity/Hazard/Poison	Notes and Comments
Ammonium bifluoride <sup>8</sup> (NH <sub>4</sub> F.HF)	Extremely hazardous in case of skin and eye contact, ingestion and inhalation	Never add water to this product. It may corrode glass.
Bromine <sup>3,9</sup>	Highly toxic by inhalation and ingestion; severe skin irritant; very strong oxidizer; poison inhalation hazard zone-tear gas	Emit fumes of bromine and bromides upon thermal decomposition
Cyanides <sup>8</sup> (CN <sup>-</sup> )	Potentially fatal if inhaled or swallowed. Vapor may cause flash fire. May polymerize. Container may rupture or explode	May react on contact with air, heat, light or water
Diethyl Ether <sup>10</sup>	Severe fire and explosion hazard	Dispose of within 12 months of receipt, or 6 months of opening, whichever is shorter
Hydrofluoric Acid <sup>10</sup>	Exposures greater than 25 sq. in. of body surface area may be fatal	Call the safety officer immediately in the event of a spill
Hydrazines <sup>8</sup> (N <sub>2</sub> H <sub>4</sub> )	Very hazardous and extremely reactive and many are carcinogens. Hazardous by definition of OSHA: 29 CFR 1910.1200	Keep locked up and away from heat, source of ignite, direct sunlight. Keep container dry.
Hydrogen Peroxides <sup>3</sup> (30%)	Severely corrosive and cause severe skin burns and eye damage. May cause fire or explosions.	Keep away from heat, sparks, open flames, and hot surfaces. No smoking
Mercury and all of its compounds <sup>8</sup>	Highly toxic chemical, toxic effects include damage to the brain, kidneys and lungs	No primary or secondary school in New York state may use or purchase elemental mercury <sup>11</sup>
Organic Peroxides <sup>8</sup>	Highly flammable and explosive	Sensitive to heat, shock, friction or contact with combustible materials
Perchloric Acid <sup>10</sup>	Dedicated, specially-constructed chemical fume hoods are needed for perchloric acid use. When perchloric acid condenses on hood, duct, and fan components, condensed vapors can react with hood gaskets, greases and other collected materials to form explosive perchloric salts and esters	Perchloric acid fume hoods must be used only for perchloric acid applications, and should never be used for other chemical procedures
Picric Acid <sup>10</sup>	Picric acid is a high-powered explosive when allowed to dehydrate, and can form shock sensitive metal picrates when in contact with metals	Need to be disposed by local bomb squad or fire department <sup>3</sup>
Phosphorus (White, Yellow) <sup>8</sup>	White or Yellow form is Pyrophoric and a poison. (Red form is not pyrophoric but is very flammable and can react explosively with oxidizing agents)	Store under water and an inert gas. Handle under water. Avoid breathing vapors
Potassium Metal <sup>3</sup>	Extremely dangerous in contact with moisture and water. It spontaneously ignites when exposed to air or oxygen, can cause severe skin burns. Cutting or handling yellow-coated potassium (old, peroxide coatings) may result in a violent explosion	Must be stored under dry oil
Sodium Metal <sup>3</sup>	Dangerous when exposed to heat or flame; dangerous by reaction with moist air, water or any oxidizer. Spontaneously flammable when heated in air; reacts violently with water, producing very dangerous hydrogen gas	Sodium metal must always be stored under dry mineral oil to prevent contact with moist air

**Always refer to the Safety Data Sheet**

# Federal Regulations on Iodine<sup>12</sup>

Drug Enforcement Administration (DEA); 21 CFR Parts 1309 and 1310 (Rules - 2007)

**This rulemaking establishes regulatory controls that will apply to iodine crystals and iodine chemical mixtures that contain greater than 2.2 percent iodine. Persons handling regulated iodine materials are required to register with DEA, are subject to the import/export notification requirements of the Controlled Substances Act (CSA), and are required to maintain records of all regulated transactions involving iodine regardless of size.**

**Crystal iodine is commonly found in the chemical storage rooms of high schools. Make sure you know that it is federally regulated.**

## Reference:

1. MSDS: Material Safety Data Sheet
2. SDS: Safety Data Sheet
3. Flinn's "Scientific Catalog Reference Manual", 2012 and its Safety Data Sheet (SDS) on Line: <http://www.flinnsci.com/msds-search.aspx>
4. About Education: <http://chemistry.about.com/od/chemistrylab/a/Chemical-Storage-Color-Codes.htm>
5. GHS: Globally Harmonized System
6. Texas A & M University, Environmental Health & Safety on Line: <https://ehsd.tamu.edu/Pages/LabSafety.aspx> (Chemical Inventory Worksheet)
7. MSDS online, GHS 101: U.S. Adoption (Hazcom 2012): <https://www.msdsonline.com/resources/ghs-answer-center/ghs-101-u-s-adoption>
8. Google MSDS/SDS online search
9. Princeton University on line MSDS: <http://www.princeton.edu/prism/mnfl/current-users/safety/msds/>
10. Wayne State University, Office of Environmental Health and Safety" website: <http://oehs.wayne.edu/labsafety/hazardous-chemicals.php>
11. New York State Environmental Conservation Law Title 21; 27-2107
12. U.S. Department of Justice, Drug Enforcement Administration on Line: [http://www.deadiversion.usdoj.gov/fed\\_regs/rules/2007/fr0702.htm](http://www.deadiversion.usdoj.gov/fed_regs/rules/2007/fr0702.htm)