

Discussion and Notes

Keep a copy of these safety training notes and a signed attendance sheet to verify regular safety training. Regulatory inspectors will usually request proof of safety training. A copy of the sign-up sheet that we suggest using may be found at www.flinnsci.com/media/412875/signup.pdf.

Chemical Labels and the New GHS Requirements

The chemical label is an important and often-overlooked safety aid. To prevent possible accidents, always take the time to read the name of the chemical on the bottle and briefly review the safety warnings before using any chemical.

GHS Label Requirements

In March 2012 OSHA updated the Hazard Communication Standard (and, by extension, the Laboratory Standard) to incorporate the Globally Harmonized System of Classification and Labeling of Chemicals, better known as GHS. GHS provides a set of objective criteria for classifying the physical and health hazards of chemicals. To remove ambiguity about the degree of risk inherent in using a chemical, GHS further specifies the use of standard symbols and language elements to convey the hazard information on chemical labels. Hazardous chemical labels will be required to include pictograms, a signal word, as well as specific hazard and precautionary statements. The pictograms, signal words, and hazard statements will help you quickly identify and describe the nature of the hazard(s). Precautionary statements provide guidance to prevent accidents and avoid exposure to chemicals.

Pictograms and the Signal Word

According to the GHS scheme, eight pictograms, shown below, are associated with 16 different physical hazards and 10 health hazard categories. Examples of physical hazards include: explosive, flammable, oxidizing, and self-reactive. Health hazard categories include acute toxicity, corrosive to skin and eyes, respiratory irritants, allergens and skin sensitizers, and carcinogens, mutagens or reproductive toxins. Listed below each pictogram is an example of a chemical that would fit into the hazard category. In addition to the pictograms, GHS requires the use of signal words, either Danger or Warning, to heighten awareness of the relative risk when using certain chemicals. (Danger is the more severe warning!) Depending on their hazard rankings, not all chemicals will have a pictogram or signal word.



Acutely toxic
Copper(II) Chloride



Oxidizer
Ammonium Nitrate



Gas under pressure
Oxygen



Corrosive to skin or eyes
Hydrochloric Acid



Explosive or self-reactive substance
Not in school science labs!



Irritant to skin, eyes or respiratory tract
Iodine



Flammable or self-reactive
Methyl Alcohol



Carcinogen, mutagen or reproductive toxin
Formaldehyde

Hazard and Precautionary Statements

Pictograms and signal words convey the general physical and health hazards of chemicals. To understand the relative hazards, GHS assigns specific hazard statements to chemicals. For example, the hazard statement “Toxic if swallowed” is assigned to chemicals with acute toxicity (LD₅₀ values) between 50 and 300 mg/kg, while “Harmful if swallowed” is used for chemicals with acute toxicity between 300 and 2000 mg/kg. GHS has codified 82 specific, unique hazard statements.

Understanding physical and health hazards is one aspect of chemical safety. Taking precautions to prevent accidents and minimize exposure is the rationale behind more than 300 different precautionary statements in the GHS labeling requirements. To illustrate how the hazard and precautionary statements work together to protect you when using a chemical, consider the following label elements for a flammable liquid such as ethyl alcohol. With a flash point of 14 °C, ethyl alcohol is classified as a Category 2 flammable liquid in the GHS scheme, and the assigned hazard statement is “Highly flammable liquid and vapor.” Five precautionary statements associated with this hazard describe the safe use of this chemical and appropriate response measures in the event of exposure or fire:

- ◆ Keep away from heat, sparks, and open flames.
- ◆ Keep container tightly closed.
- ◆ Wash protective gloves and clothing after handling.
- ◆ IF ON SKIN (or hair): Immediately remove all contaminated clothing. Rinse skin with water.
- ◆ In case of fire: Use a triclass dry chemical fire extinguisher.

New Flinn Scientific GHS Sample Label

A well-written and designed chemical label will reduce accidents and may even save lives. For more than 35 years you have counted on Flinn Scientific labels to help you safely store, handle and use laboratory chemicals. We are excited with the opportunity to further improve chemical safety by adding the “right-to-understand” GHS label elements* while preserving the indispensable Flinn storage, disposal, shelf-life, and hazard alert advice. See the next page for a new GHS-compliant Flinn Scientific label, and a convenient guide to using this information. Note that chemical providers, such as Flinn Scientific, have until June 2015 to reclassify and produce GHS-formatted labels for all products.

**In announcing the GHS revision, OSHA stated that its goal was to transform the “right-to-know” laws into the right to understand.*

Thank You for Your Support!

This safety note fulfills part of the new OSHA training requirements for HazCom 2012 and GHS. Remember that OSHA has set a December 2013 deadline for all employers, including schools, to provide training to ensure that teachers and staff understand how to read GHS labels. Look for more training information from Flinn Scientific in the coming months to help you become proficient and stay safe. Please continue to support our efforts to improve safety in school science labs by ordering your science supplies and laboratory chemicals from Flinn Scientific.

Next Month’s Topic

Live Animals in the Classroom

FLINN
SCIENTIFIC, INC
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New Flinn GHS Labels Improve Chemical Hazard Identification

3 

4 → **DANGER!** May intensify fire; oxidizer. Keep away from heat, sparks, and open flames. Harmful if swallowed. May cause an allergic skin reaction. Suspected of causing cancer. Avoid breathing dust and fumes. Keep away from combustible materials. Wash thoroughly after handling.

5 **FIRST AID:** IF SWALLOWED: Rinse mouth. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN: Rinse with soap and water. IF IN EYES: Rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice or attention if exposed or concerned.

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FLINN SCIENTIFIC INC.
"Your Safer Source for Science Supplies"

C0413 500 g

1 **COBALT NITRATE**
cobalt(II) nitrate, hexahydrate, laboratory grade, $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$, F.W. 291.05

2 ★ **HAZARD ALERT:** Moderately toxic by ingestion or inhalation; ori-rat LD_{50} : 691 mg/kg. TLV: 0.1 mg/m³. Wear protective gloves and eye protection. Obtain special instructions before use.

IN CASE OF FIRE: Use a triclass dry chemical fire extinguisher.

7 LOT: 16458

8 STORAGE: Inorganic #3. Store in a Flinn Chem-Saf Bag.

9 **INORGANIC #3** **I**

10 DISPOSAL: #27f

11 SHELF LIFE: Poor; substance deliquescent.

12 SOLUBLE: Water, alcohol, and most organic solvents.

13 CAS NO: 10026-22-9

14 



OXIDIZER/REDUCER

1 Product Name, Quality, Concentration, etc.

Full chemical name is shown and sometimes a common alternative name. The chemical formula and formula weight are immediately below the name. The quality of the substance (e.g., reagent, laboratory grade, etc.) is also clearly indicated.

2 Hazard Alert

Hazard data are provided to alert the science teacher to the hazardous nature of each chemical. This information is helpful when you are storing, dispensing, or using the product.

3 GHS Hazard Pictograms

Graphic icons that convey physical and health hazard information assigned to the GHS hazard class and category.

4 Signal Word

The word "Danger" or "Warning" is used to indicate the relative level of severity of the hazard and alert the reader to potential hazards as described on the label.

5 GHS Hazard and Precautionary Statements

Phrases that describe the physical and health hazards and recommended measures to be taken to reduce or prevent adverse effects resulting from exposure to a hazardous chemical.

6 First Aid

GHS and other precautionary statements relating to chemical exposure.

7 Lot Number

The fingerprint of the chemical you have purchased. A series of numbers identifies for Flinn Scientific what the chemical is, how it was packaged, when it was packaged, who the chemical manufacturer is, etc. Lot numbers are a very important part of any chemical label!

8 Flinn Storage Method/Number

Numbers refer to the compatible chemical family in which this item should be stored. For example: Inorganic #9 refers to the family that includes all inorganic acids except for nitric acid. A detailed table of these families and even their most compatible shelf order will be found on pages 1178–1185 of the 2013 *Flinn Scientific Catalog/Reference Manual*.

9 Storage Method/Number, Enlarged

The Flinn compatible family storage number is enlarged so you can easily locate and return the chemical container to its proper storage location.

10 Suggested Disposal Method

Suggested disposal options for small, laboratory quantities of chemicals are provided in the 2013 *Flinn Scientific Catalog/Reference Manual* on pages 1188–1214. The number shown in the chemical listing refers you to a specific and suggested disposal method for that particular product.

11 Shelf Life

A general statement about anticipated shelf life. Since conditions vary widely, the statement is general and should be accepted in that context. Shelf life data are based on comprehensive literature information.

12 Soluble

In what solvent(s) is this substance soluble? We have listed the common solvents. Limited space may prevent us from listing all of the possible solvents.

13 Chemical Abstract Service Registry Number (CAS)

CAS means Chemical Abstract Service. The CAS number is a unique identifying number for each specific substance.

14 Date Labeling

Every substance is date labeled. Date labeling was pioneered by Flinn. Current science teachers and their successors are assured that the age of chemicals purchased from Flinn is not a mystery.