

Science Department Safety Training Notes

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. See our suggested sign-up sheet at www.flinnsci.com/ media/412875/signup.pdf

See the article "Newest HazCom Chemical Hazard: GHS Classification Shock" by Glenn D. Trout, which appeared in the October 2013 issue of OH&S Occupational Health and Safety.

http://ohsonline.com/ articles/2013/10/01/newesthazcom-chemical-hazardghs-classification-shock.aspx

Have You Heard of GHS Classification Shock?

Can a law create new chemical hazards? Having followed the transition to new formatted labels and Safety Data Sheets (SDS) since adoption of GHS provisions to the Hazard Communication Standard in 2012, you might think the answer to this question must be yes. Let's look at how hazard classification has changed to help us evaluate the hazards and risks associated with chemical use in teaching laboratories.

Hazard Classification and Criteria

GHS—the Globally Harmonized System of Classification and Labeling of Chemicals—provides objective criteria for classifying the physical and chemical hazards of chemicals into 26 major categories. While regulations cannot change the *properties* of a chemical, GHS has changed how the hazardous properties of a chemical are *communicated* to employees and others. And, in some cases, those changes may appear dramatic, and even shocking!

Material Safety Data Sheets have always included information about the flash point and associated risk of flammable chemicals. While specific criteria or cut-off points for different levels or classes of flammable liquids have changed with GHS, the statements associated with a newly assigned hazard category for a flammable chemical will still sound familiar, as in the following example for ethyl alcohol: "Highly flammable liquid and vapor. Keep away from heat, sparks, and open flames."

In contrast, hazard statements for newly defined acute toxicity hazard categories, which also have always been reported on (M)SDS, may raise alarm (and rightly so). The required hazard statement for sodium dichromate, which has an oral LD_{50} value of 50 mg/kg, is "fatal if swallowed." Consulting the SDS before using this chemical will probably cause you to "sit up and take notice" more than an older statement, such as "extremely toxic," might have. That was the intent and purpose of GHS, to improve understanding of hazards.

GHS has also codified *new* health hazard categories and statements that may raise alarm. Chronic toxicity characteristics appear in at least 4–5 new categories: carcinogenicity, germ cell mutagenicity, reproductive toxicity, specific target organ toxicity, and skin or respiratory sensitization. Reading the litany of these hazards for transition metal salts such as cobalt nitrate or nickel nitrate will of necessity increase the precautions that you take to eliminate *exposure* to these substances by ingestion, inhalation or skin absorption.

Hazard versus Risk

GHS includes specific precautionary statements to differentiate between hazard and risk and reduce or eliminate the latter. The safety precautions for working with any chemical can usually be "distilled" to a fundamental principle, *chemical hygiene*. Avoid contact of all chemicals with eyes and skin, and do not breathe chemicals that may be harmful if inhaled. The use of engineering controls, such as a fume hood, and appropriate personal protective equipment, is non-negotiable and is also summarized in the Safety Data Sheet for each chemical. Another example of the difference between hazard and risk arises when working with a flammable substance. The risk is that it may ignite upon contact with a flame, a source of electricity, or even a hot surface. The appropriate precautions are: Keep away from heat, sparks, and open flames. Store in a dedicated flammables cabinet or in a secure, isolated location with secondary containment. Keep container tightly closed and keep cool.

Please Read the SDS

Protect yourself and your students—always read the label and SDS before working with any chemical. READ the label as you REACH for the chemical. You will be glad you did! Flinn Scientific Safety Data Sheets are GHS-compliant and are available free online for all chemicals. Please visit the Flinn website at http://www.flinnsci.com/msds-search.aspx

Flinn Online ChemventoryTM Includes SDS

Maintaining an accurate and up-to-date inventory of all chemicals will help you improve safety and eliminate risk in the science lab. Flinn Online Chemventory includes GHS hazard information for all chemicals and provides a convenient and easy way to manage your SDS library and print chemical labels. For more information, visit the Flinn website at http://chemventory.flinnsci.com/

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Next Month's Topic

Review of Chemical Disposal Procedures

