

SAFE SCI: Be Protected!
MERCURY: It Is More Than A Planet In Our Solar System!

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I. AND WHAT PLANET ARE THEY ON?

Picture this scenario:

Last summer science textbooks for a high school were being stored in a large trailer as a result of laboratory renovations. Inadvertently, a mercury barometer was also stored in the same trailer. The mercury vaporized during the hot summer days and then condensed back onto the books at night. The books had to be destroyed and replaced at a cost of about \$200,000!

➤ A second scenario visited: Last spring, students in a high school were cleaning out a science supply closet and dropped/broke 12 thermometers. The school had to be evacuated and a hazardous waste removal firm was contracted to clean up the spill at a cost of \$6,000. With the high cost of insurance, they did not meet their deductible!

➤ A third scenario visited: Two years ago, two students duped a custodian into unlocking a door to a middle school science laboratory so they could get a forgotten textbook that was needed for homework. The custodian, thinking he was doing a good deed, allowed the students to enter. While one student kept the custodian entertained, the other quickly secured a bottle of mercury in the teacher's desk drawer. A few days later, the students were rushed to the hospital with mercury poisoning. The parents are currently in litigation seeking damages!

II. SO WHAT IS THE PLANETS ATMOSPHERE LIKE?

Mercury is a natural occurring element found in nature. At room temperatures, the metallic shiny liquid evaporates at a slow rate. At elevated temperatures, the evaporation process effecting an odorless and colorless vapor is increased. A quick inventory of school science laboratories indicates mercury can be found in several places such as, chemical compounds used in experiments, thermometers, batteries, fluorescent bulbs, switches and more. Most frequent incidents include mercury filled thermometers which when broken, expose occupants to mercury vapors. Students and employees are also often exposed to mercury vapors resulting from chemical reactions in laboratory experiments or observing the properties of the metal in a classroom demonstration.

Exposure results from either breathing vapors or handling liquid mercury. The vapor route tends to be more dangerous in that it can quickly get to various organ sites resulting from the blood supply via the lungs.

III. IS THE PLANETS ATMOSPHERE HAZARDOUS TO OUR HEALTH?

Breathing mercury vapors can be a burden to our health. Various body systems/organs such as lungs, brain, kidney and nervous system are often targets. Acute symptoms include chest pain, nausea, vomiting, diarrhea, fever, coughing, breathing problems. Inhaled vapors can affect functions of the nervous system, in addition to kidneys, skin and lungs. Chronic symptoms include weight loss, short-term memory loss, shakiness and more.

IV. WHAT IF THE SPACE SUIT FAILS AND THERE IS EXPOSURE?

If you should have a mercury spill in the science laboratory or classroom, here are a few things you will need to consider. Prudent suggestions include:

- Evacuate occupants from the room. This will reduce exposure to vapors.
- Be cautious about tracking the chemical to other parts of the building.
- Commercial mercury spill kits can be used to pick up small spills such as a broken thermometer. In these types of situations, consider the procedures established by the Connecticut Department of Health:
- Wear rubber gloves and splash goggles.
- Carefully pick up pieces of broken glass and place them into a zip lock type plastic bag.
- Use a squeegee or cardboard to gather additional bits of glass and mercury.
- Use of an eyedropper to pick up small mercury beads can be effective.
- Use of a sticky side of two-inch duct tape can help to pick up remaining mercury beads and glass.
- When the task is completed, place all remaining tools (eyedropper, squeegee), etc. into another zip lock type plastic bag.
- Remove rubber gloves and also place them into the same type of bag.
- Dispose of the bags via a solid waste program, solid waste contractor or other environmentally/legally sound approach.
- Air out the room for at least three or more days to remove any mercury vapors.
- For larger spills, contact the appropriate authorities in your town or state (see section VI in this column).

- Vacuuming the spill with a regular vacuum cleaner only exacerbates the situation by causing the vapors to dissipate in the air. Wait at least 2-3 days after the spill and clean up before attempting to vacuum with a regular vacuum cleaner.
- In unidirectional ventilation air handling equipment (no circulation of laboratory air to other parts of the facility), turn on the ventilation to help evacuate the vapor molecules from the facility. In air handling units which recycle air, dampers need to be adjusted to provide for exhausting of the area. If this action is not possible, ductwork to and from the room should be closed off to prevent vapors from spreading to other parts of the facility.
- These cleaning recommendations are for hard surfaces such as tile or linoleum. Carpets or other porous surfaces should be discarded if at all possible.
- If you have a floor with cracks or seams, you may wish to consider having an air quality test done to determine if mercury vapor is at unacceptable levels.

V.PICK ANOTHER PLANET!

One method of avoiding these types of problems is to consider alternatives to using mercury in the laboratory. For example, use non-mercury type thermometers for laboratory experiments or CBL temperature probes. Limit student access to mercury by only have a display container which is kept in a secured area under lock and key. If use of mercury is required, make sure proper storage is used (avoid contact with or storage near acetylene, fulminic acid or ammonia). Also, storage must be in a secured area, as are all hazardous chemicals.

“ A quick inventory of school science laboratories indicates mercury can be found in several places ...”

VI. FINAL CHECK LIST BEFORE BLASTING OFF!

For further assistance or help in cleaning up a mercury spill, consider contacting one or more of the following agencies: Local fire department, public health department, poison control center, state environmental protection agency or state department of public health. Also remember that non-certified employees such as paraprofessionals and custodians who work in the science laboratory area also need special training in dealing with hazardous chemicals as part of their job.

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— MSDS —

Did you know that every chemical in your lab and school must have a Material Safety Data Sheet (**MSDS**) available for reference purposes ?

The following web sites offer free downloads of MSDS pages. Some sites require free registration to sign on.

www.MSDS online.com
Free access to MSDS pages
www.EHSManager.com
Industrial, but offers free chemical manager data base after signing on.

www.Hazweb.com

Gives links to state regulations and laws. “You can research, learn about and discuss environmental information and hazardous materials practices. ” Also, Yahoo.com can be a source of information about MSDS.

ED.NOTE : This information is provided for reference purposes and is not an endorsement of one site over another. There are many other web sites that also deal with this topic.



Here are some of Eisenhower National Clearing Houses's August Digital Dozen -- sites reviewed for educational content, instructional strategies, and multimedia design.

One Sky, Many Voices (5-9)
<http://www.enc.org/resources/records/0,1240,016316,00.shtm>

...
This inquiry-based middle school weather curriculum was designed for students in a variety of learning environments. Participants download curriculum ideas, gather real life data, surf the web for additional information, and communicate with other schools and students.

Chemicool Periodic Table (9-12)
<http://www.enc.org/resources/records/0,1240,014122,00.shtm>

...
This site not only offers standard periodic table information such as states, appearance, reactions, but also runs a search in the Encyclopedia Britannica for each element. The easy-to-use site thus takes you from a simple table right to information and articles that can help students gain a broader understanding of the place and use of chemical elements.