


NASTTPO
National Association of
SARA TITLE III
PROGRAM OFFICIALS

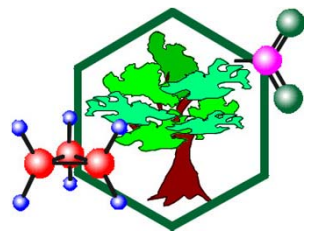
**TITLE III
1988**

**NASTTPO & CEPP
National Conference 2010**

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US EPA Region 1 – New England



Moving Schools from **Hazardous and Toxic Chemicals** Towards **Safe, Green and Sustainable Chemistry**



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- US EPA – Region 1 – New England
- Senior Scientist
- Green Chemistry Advocate
- Senior Assistance/Enforcement Coordinator
- Small Business Advocate
- Emerging Chemicals Liaison
- PBT Regional Expert
- Nano Materials Liaison
- **Friend of Schools**





NSTA Position Statement

Liability of Science Educators for Laboratory Safety

Introduction

Laboratory investigations are essential for the effective teaching and learning of science. A school laboratory investigation ("lab") is an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC 2006, p. 3). Inherent in laboratory-based activities is the potential for injury. Studies show that safety in K-12 school science instruction needs immediate and significant attention. (Gerlovich et al. 2005)

CDCs Hazardous Substances Emergency Events Surveillance

- Hazardous Chemical Incidents in schools
- 423 chemical accidents in 15 states
- #1 incident: human error
- #1 chemical: mercury

- Everyday school chemicals are involved in accidents or illegal use.

CSB to Investigate Laboratory Explosion at Texas Tech University Chemistry Department

January 19, 2010
Investigation Details:
[Texas Tech University](#)

Washington, DC, January 19, 2010 - The U.S. Chemical Safety Board (CSB) will investigate the causes of a January 7 explosion that severely injured a graduate student at Texas Tech University in Lubbock, Texas, the CSB announced today.

University officials told the CSB the accident occurred in the chemistry department during the handling of a high-energy metal compound, which suddenly detonated. Texas Tech had entered into an agreement with Northeastern University, which holds a contract from the U.S. Department of Homeland Security to study the high-energy materials.

"We see serious accidents in high school and university labs every year, including a tragic fatality a year ago at UCLA," said CSB Chairman John Bresland. "I believe it is time to begin examining these accidents to see if they can be prevented through the kind of **rigorous safety management systems** that we and others have advocated in industrial

Why we are here!



Do no harm to our children!

Schools Chemical Management Observations

- Look at the chemistry at home.
- When in doubt, save it.
- Improper use & storage.
- I know I have it somewhere.
- Only pesticides cause cancer!
- De-sensitized to chemical of the day
- When in doubt, save it!!!!!!!!!!!!!!
- Down the drain!

Root Cause:

- We manage our chemicals the same way we use chemicals products at home.
- We have been de-sensitized to the toxic/hazardous chemical crisis of the day, month or year. (The sky is falling)
- It will not happen to ME/us.
- I provide the students access to the MSDS
- We've never had an accident!
- What waste! Down the drain!
- It's all the same.

MA Public School Systems

- OSHA state = NO
- Right-To-Know = NO
- Lab Hygiene Law = NO
- Labeling Requirements = NO
- Hazardous Waste Law (RCRA) = YES

- So, What's the problem?
- **Education, Training & Accountability**

Integrated Chemical Management

- "the pharmacy" approach
- Centralized, controlled stockroom
- All "stock" chemicals are removed from the classrooms, prep areas, & labs.
- All chemicals are inventoried
- Proper storage & labels
- Real time chemical database
- Complete MSDS library
- Controlled purchasing
- "Mercury Free" schools
- > 40 MA Public & Private School Systems (2-NH)
- > 50,000 students, teacher & staff

Integrated Chemical Management Partnerships

- Waltham School System
- Revere High School Science Department
- Lawrence High School Science Dept
- Saugus School System
- Hampton NH School System
- Amesbury High School Science/Art
- North Reading Science Department
- Mount Saint Joseph's Academy
- Everett High School: Old -> New
- Braintree High School Science Department

Integrated Chemical Management Partnerships

- Quincy School System: Middle & High Schools
- Masconomet Regional Science Department
- Franklin Science Department
- Randolph Science Department
- Belmont Science Department
- Arlington Science Department (09)
- Malden Science Department (09)
- Haverhill Science Department (09)

Integrated Chemical Management Partnerships

- Malden School System (09)
- Milton School System (09)
- Plymouth School System (09)
- Wilmington School System (09)
- Newburyport High School (09)
- Quincy High School (09)
- & others
- ~10,000 students

Integrated Chemical Management Partnerships: 2010

- Milton Middle School
- Cape Cod Regional Vocation High School
- Rockport High School
- Ludlow High School
- Pittsfield School System (2 HS & MSs)
- Holyoke School System (2 HS & MSs)
- > 12,000 students, teachers & staff

Managing our chemical resources

- **What, Where, When & Why**
- **What do you have?**
- **Where are these chemicals?**
- **When do I have these chemicals on site?**
- **Why do I have ALL these CHEMICALS?**











































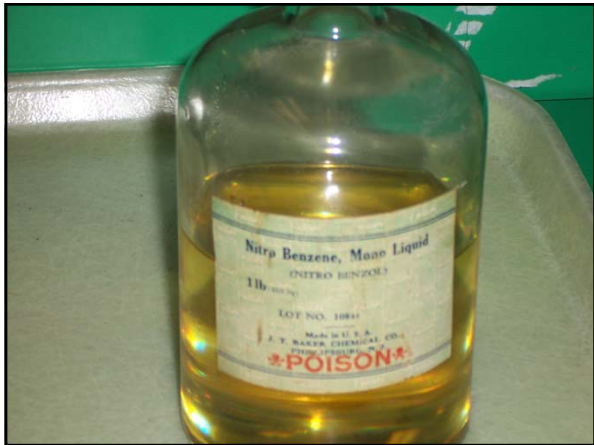






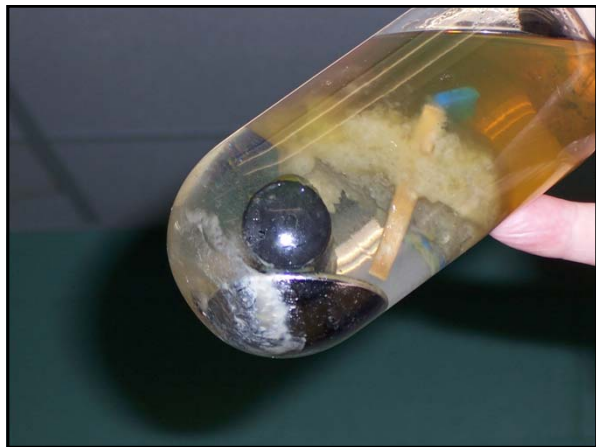






























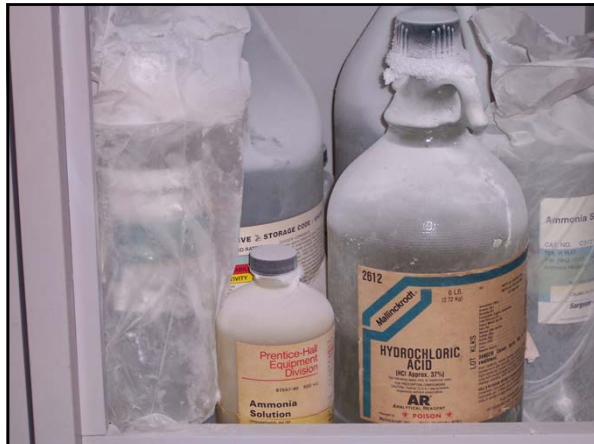


Gas Cylinders: Lecture size

- Initial cost + \$125-150 per cylinder
- Cylinders are non returnable
- Disposal Cost = \$200-250 per cylinder
- 15 cylinders removed = \$3000
- Metal cylinder recycled
- 9 cylinders must be removed by hazardous waste company



























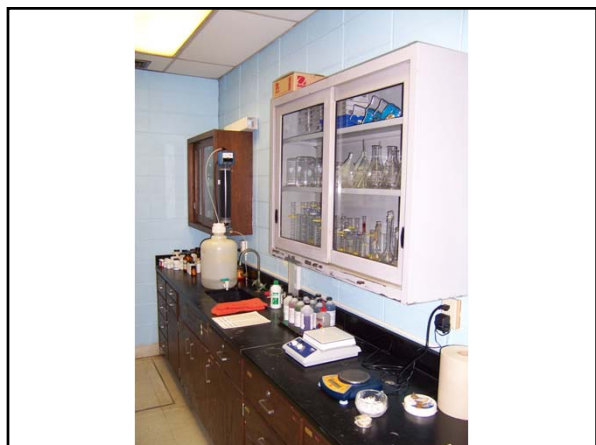












Addiction (broadly):

- Persistent compulsive use of a substance(s) known by the user to be harmful
- When an individual persists in the use of ...
- Compulsive and repetitive ... despite harmful consequences

5 Stage of Recovery

- Denial --- there is no problem ...
- Anger --- Why me? I did not ask for this!
- Bargaining ... relegate & delegate
- Depression ... I'm worried. I don't know where to start
- Acceptance: Please help us. We need to change.

Solution:

- Safer chemistries, labs, demonstrations
- Reduced waste & reduced cost
- Reduced use of energy & resources
- Proper disposal of waste
- Less exposure, fewer accidents, & less toxic
- Prevent pollution (P2)

Solution: EPA/School Partnership

- Provide expert knowledge
- Provide on site assistance
- Reduce cost of clean out
- Create a chemical inventory
- Provide safe Chemical Management
- "Mercury Free" school
- Provides training
- Protect our children

Understanding Risk:

- Risk = Hazard X Exposure
- Hazardous substance is defined by characteristics of the chemical(s)
- Hazardous material = liquid, solid, gas or waste
- Hazardous materials = explosives, drugs, flammables, reactives, poisons, toxics
- Toxic = able to damage an living organism or organ

Chemical Inventory Database: (xls)

CHEMICAL NAME	SYGL	CAS #	SUPPLIER	AMOUNT	T Y P E	Haz Waste	RCRA Code	Health	Flammability	Reactivity	PPE
1-Naphthol	S	90-15-3				N	N	2	1	0	E
1-Pentanol (See N-Amyl Alcohol)	L	71-41-0				Y	D001	2	3	0	H
Abscisic Acid	S	14375-45-2				N	N	2	1	0	E

Moving to Safe, Green, Sustainable Chemistry

- Held Accountable!
- Awareness of Toxic/Hazard characteristics
- Consideration of alternative
- Explore solutions/Reach out
- Partnership: Beyond Benign
- Continuous Improvement Program

- Education, Training & Commitment

Green Chemistry

- 12 principles
- Less hazardous chemicals
- Less toxic to humans
- Less RCRA hazardous waste
- Less costs, energy & resources
- Renewable feedstock
- Safe & sustainable chemistry

Beyond Benign:

- Specializes in curriculum development, outreach, education and training. Beyond Benign's unique educational approach produces materials and trainings that are
 - Audience driven
 - Based on core sustainability values
 - Activity-based approach
 - State of the art
 - Relevant to today's science

School Chemical Management

- Systematic Comprehensive Approach
- Safety & Security
- Reduce Risk
- Decrease Toxic Exposure
- Accurate Inventory
- Control Chemical Purchasing
- Reduce waste, save \$\$\$ & prevent pollution
- Comply with the laws/regulations

Questions