

1,2)

Concentrated Sulfuric Acid:

- a) Corrosive (no information provided)
- b) respiratory, burns, nausea, vomiting, kidney dysfunction, lung damage.

Methyl alcohol:

- a) Fire and Health equally.
- b) Harmful or fatal if swallowed, headache, nausea and vomiting, gastrointestinal irritation, central nervous system depression, hearing loss, blindness, eye irritation, corneal damage, narcosis, respiratory failure, low blood pressure, central nervous system disorder, drowsiness, dermatitis.

30% Hydrogen peroxide:

- a) Health
- b) Redness, pain, severe burns, blistering and bleaching of skin, vapors are corrosive and irritating to the eyes, redness, blurred vision. Splashes can cause permanent tissue destruction, corrosive and irritating to the respiratory tract, mist may burn the mucous membrane of the nose and throat, pulmonary edema and death, corrosive and irritating to the mouth, throat and abdomen, abdominal pain, vomiting and diarrhea as well as blistering or tissue destruction. Stomach distention, risk of stomach perforation, convulsions, pulmonary edema, coma, possible cerebral edema (fluid on the brain), death.

Iodine crystals:

- a) Health and reactivity are equal.
- b) eye damage, burns, irritation, pain, abdominal pain, diarrhea, fever, vomiting, irritate or burn respiratory tract, breathing difficulties, headache, congestion, insomnia, conjunctivitis, bronchitis, tachycardia, weight loss, death.

3) Could not find the information on OSHA website.

a) If NaOH is spilled in your eyes, flush for 15 minutes with lots of water.

<http://www.nlm.nih.gov/medlineplus/ency/article/002487.htm>

b) If you feel sick after inhaling methanol vapors, "Seek immediate medical help. DO NOT make a person throw up unless told to do so by Poison Control or a health care professional."

<http://www.nlm.nih.gov/medlineplus/ency/article/002680.htm>

c) If you spill acrylic acid on the skin, "Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse."

<http://www.itbaker.com/msds/englishhtml/a1562.htm>

4) A chronic effect is an effect that occurs over a long period of time. It slowly gets worse over time. Exposure to mercury would result in a chronic neurological condition. An acute effect is something that occurs rapidly and is not long lasting. Spilling a mild corrosive on ones hand, resulting in a 1st degree burn would be an example of an acute effect.

5) http://www.ilpi.com/msds/osha/1910_1200_APP_A.html#corrosive

Corrosive: A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. For example, a chemical is considered to be corrosive if, when

tested on the intact skin of albino rabbits by the method described by the U.S. Department of Transportation in appendix A to 49 CFR part 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This term shall not refer to action on inanimate [non-living] surfaces."

It appears that OSHA tests materials on albino rabbits in order to determine if a chemical has corrosive properties. If the rabbits skin is destroyed or changed within four hours, it is considered a corrosive chemical.

Irritant: A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if, when tested on the intact skin of albino rabbits by the methods of 16 CFR 1500.41 for four hours exposure or by other appropriate techniques, it results in an empirical (experimental) score of five or more. A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques.

If the chemical that is tested on the albino rabbits is exposed to the chemical for four hours, and tests are required to determine if a change has occurred, if a change has occurred it is considered an irritant.

Sensitizer: A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

If a person who is repeatedly exposed to the chemical, and develops an allergic reaction, the chemical is considered a sensitizer.

Highly toxic:

- a. A chemical that has a median lethal dose (LD_{50}) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
- b. A chemical that has a median lethal dose (LD_{50}) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
- c. A chemical that has a median lethal concentration (LC_{50}) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

If a substance that will kill an albino rats, with a certain concentration in a certain period of time, it is considered highly toxic.

Toxic: A chemical falling within any of the following categories:

- a. A chemical that has a median lethal dose ($LD(50)$) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
- b. A chemical that has a median lethal dose ($LD(50)$) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.

- c. A chemical that has a median lethal concentration (LC(50)) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

When a substance is administered to rats at a certain concentration and time period, if that substance kills the rat under these conditions it is considered toxic.

Carcinogen: A chemical is considered to be a carcinogen if:

- a. It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or
- b. It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or,
- c. It is regulated by OSHA as a carcinogen.

OSHA has deferred to outside agencies to determine whether or not a chemical is considered a carcinogen.

6) A 30% hydrogen peroxide solution is reactively stable under normal conditions, however, if it is exposed to heat it will tend to decompose and release oxygen. It is incompatible with organic materials, rust, dirt, combustibles, and powdered metals. It does not polymerize. It has the toxicological effect of producing adverse mutagenic effects on laboratory animals. The safety limit of exposure is one part per million.

This information would suggest that gloves and caution should be used when preparing this chemical. It should be stored in a cool place to prevent or slow breakdown.

The hydrogen peroxide found in the stores is only 3%, not 30%.

7) Tie hair back. Do not wear loose or baggy clothing. Closed toe shoes. Apron and gloves if needed. No dangly jewelry.

8) "ANSI Z87.1 approved chemical splash goggles or safety glasses, as appropriate or directed by your instructor, shall be worn at all times in the laboratory or field, including pre-laboratory work and clean-up, unless the instructor specifically states that the activity does not require the use of chemical splash goggles or safety glasses."

<http://www.nsta.org/pdfs/SafetyInTheScienceClassroom.pdf>

9) Horseplay, not following safety rules, refusal to wear goggles, eating, drinking, applying cosmetics, chewing gum

10) Yes, but do not manipulate them.

11)

a) Send the student to the nurse. Don gloves and sweep up glass and put it into a special glass bag. Clean up any blood and put into biohazard bag.

- b) Place students face into the eyewash station and rinse student's eyes out for 15 minutes. Have another student call the nurse.
- c) Turn off any gas and burners before leaving the room.
- d) Cover flames with a fire blanket, or if a fire blanket is unavailable, beat out the flames with another lab manual. *First, use fire extinguisher to douse the flames.*
- e) If the student is not working with chemicals that will be reactive with water, guide the student with a sense of urgency over to the shower. Alternatively, smother the student and flames with a fire blanket. If neither of these options are available, roll the student on the ground in an attempt to put out the flames. Call the nurse.
- f) If the chemicals are corrosive take off your pants. To prevent total embarrassment, make sure that you are wearing boxers. If the chemical has soaked through to the boxers, hope you are wearing a long shirt. Stand under the emergency shower and activate the water to make sure any chemicals are washed off of your body. Keep a spare pair of pants handy. Do not wear expensive pants.

PSD's slots (letter pigs)

egg carton
recycled baskets
glass/castrol

Sink

foam board paper
Sawyer board

Obs

Trailer
box

fire
ethylene
cell

gallons
oil

oil
fire

foam board

paper board

Sink

eye wash
(sink) water

shelby
class

Obs

class

fire
shelby
(pigs)

Sink

Sink

Sink

Sink

Sink

Sink

fire
shelby