Practical Biotechnology

Lab1: Laboratory safety

Many laboratories contain significant risks, and the prevention of laboratory accidents requires great care and constant vigilance. Examples of risk factors include high voltages, high and low pressures and temperatures, corrosive and toxic chemicals and chemical vapors, radiation, fire, explosions, and biohazards including infective organisms and their toxins.

Measures to protect against laboratory accidents include safety training and enforcement of laboratory safety policies, safety review of experimental designs, the use of personal protective equipment, and the use of the buddy system for particularly risky operations.

In many countries, laboratory work is subject by health and safety legislation. In some cases, laboratory activities can also present environmental health risks, for example, the accidental or deliberate discharge of toxic or infective material from the laboratory into the environment.

Equipment to be provided in the laboratory

1-Eye Wash Stations

2-Fire Extinguishers

3- Liquid Chemical Waste container

4-Emergency Gas shut off Valve

5-Glass Waste container

6-Biohazard Waste container

7- Personal Protective Equipment (PPE)

8- Material Safety Data Sheets (MSDS)

9-Hazard Chemical container

10-Broom/dustpan

11- Fire Blankets

12-First Aid Kits

13- Emergency Exit

14- Ventilation holes

15- warning sings

Types of laboratory hazards

1-Chemical hazards

2-Biological hazards

3-Physical hazards and others

4-Safety hazards

4.1-Autoclaves and sterilizers

4.2-Centrifuges

4.3-Compressed gases

4.3.1-Store, handle, and use compressed gases

4.4-Cryogens and dry ice

4.5-Personal protective equipment's

4.6-Electrical

4.7-Fire

4.8-Glassware

Chemical hazards

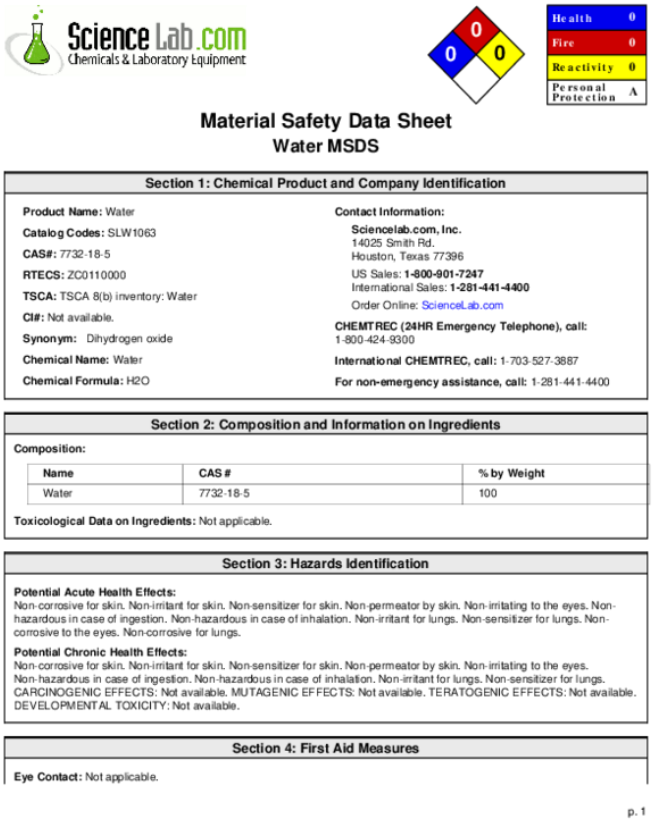
Hazardous chemicals present physical and/or health threats to workers in clinical, industrial, and academic laboratories. Laboratory chemicals include cancer-causing agents (carcinogens), toxins (e.g., those affecting the liver, kidney, and nervous system), irritants, corrosives, sensitizers, as well as agents that act on the blood system or damage the lungs, skin, eyes, or mucous membranes.

MSDS (Material Safety Data Sheets)

is a document that lists information relating to occupational safety and health for the use of various substances and products, MSDS are a widely used system for cataloguing information on chemicals, chemical compounds, and chemical mixtures. MSDS information may include instructions for the safe use and potential hazards associated with a particular material or product, along with

spill-handling procedures. The older MSDS formats could vary from source to source within a country depending on national requirements; however, the newer MSDS format is internationally standardized.

An MSDS for a substance is not primarily intended for use by the general consumer, focusing instead on the hazards of working with the material in an occupational setting. There is also a duty to properly label substances on the basis of physico-chemical, health, or environmental risk. Labels can include hazard symbols such as the European Union standard symbols. The same product (e.g. paints sold under identical brand names by the same company) can have different formulations in different countries. The formulation and hazards of a product using a generic name may vary between manufacturers in the same country.



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Chemicals & Laboratory Equipment

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Health	0
Fire	0
Reactivity	0
Personal Protection	A

Material Safety Data Sheet
Water MSDS

Section 1: Chemical Product and Company Identification

Product Name: Water
Catalog Codes: SLW1063
CAS#: 7732-18-5
RTECS: ZC0110000
TSCA: TSCA 8(b) inventory: Water
CI#: Not available.
Synonym: Dihydrogen oxide
Chemical Name: Water
Chemical Formula: H2O

Contact Information:
Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396
US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**
Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300
International CHEMTREC, call: 1-703-527-3887
For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Water	7732-18-5	100

Toxicological Data on Ingredients: Not applicable.

Section 3: Hazards Identification

Potential Acute Health Effects:
Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-irritating to the eyes. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. Non-irritant for lungs. Non-sensitizer for lungs. Non-corrosive to the eyes. Non-corrosive for lungs.

Potential Chronic Health Effects:
Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-irritating to the eyes. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. Non-irritant for lungs. Non-sensitizer for lungs. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available.

Section 4: First Aid Measures

Eye Contact: Not applicable.

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The 16 sections for MSDS are :

1: Identification of the substance/mixture and of the company/undertaking

2: Hazards identification

3: Composition/information on ingredients

4: First aid measures

5: Firefighting measures

6: Accidental release measure

7: Handling and storage

8: Exposure controls/personal protection

9: Physical and chemical properties

10: Stability and reactivity

11: Toxicological information

12: Ecological information

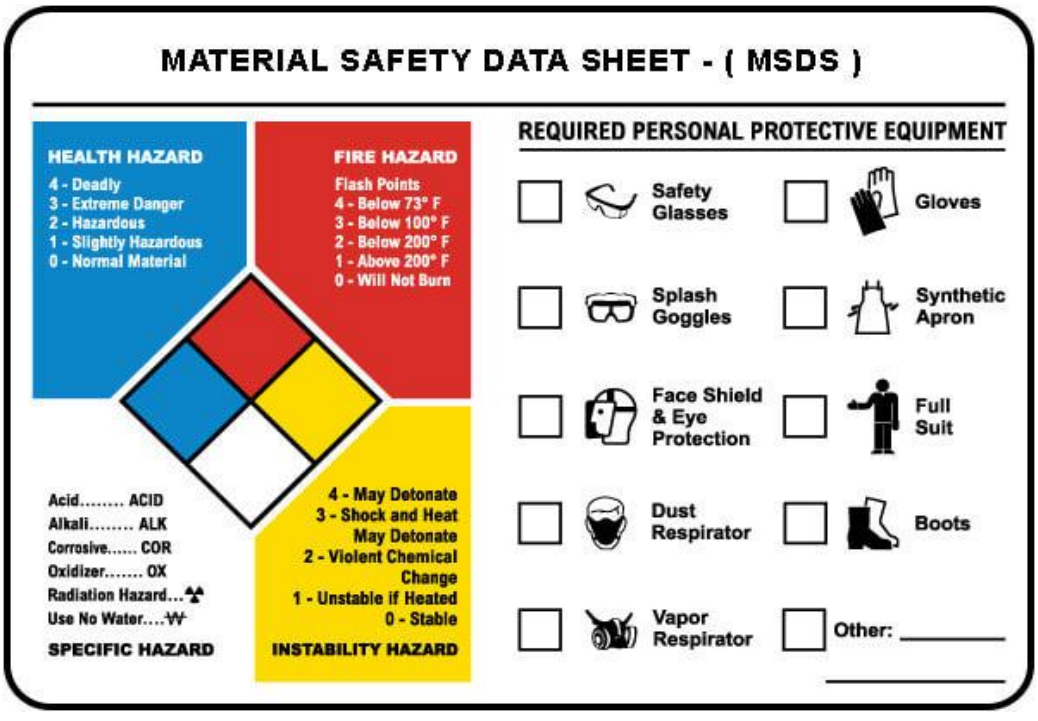
13: Disposal considerations

14: Transport information

15: Regulatory information (health and environmental regulations)

16: Other information (Date of the latest revision)

A color-coded diamond shape lists numbers rating a hazard as:



Blue for health hazard

0 – normal material
1 – slightly hazardous
2 – hazardous
3 – extreme danger
4 – deadly

Red for Fire hazard

0 – will not burn
1 – flash point > 200o F
2 – flash point > 100o F
3 – flash point < 100o F
4 – flash point < 73o F

Yellow for Instability Hazard

0 – stable
1 – unstable if heated
2 – violent chemical change
3 – shock and heat may detonate
4 – may detonate

The uncolored station of the NFPA diamond is for specific hazards:

OX – oxidizer compound

ACID – acidic compound

ALK – basic compound

CORR – corrosive compound

W– use NO WATER

☢– Radiation hazard