Environmental Chemistry

Safety Induction

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Why a Chemistry Safety Induction

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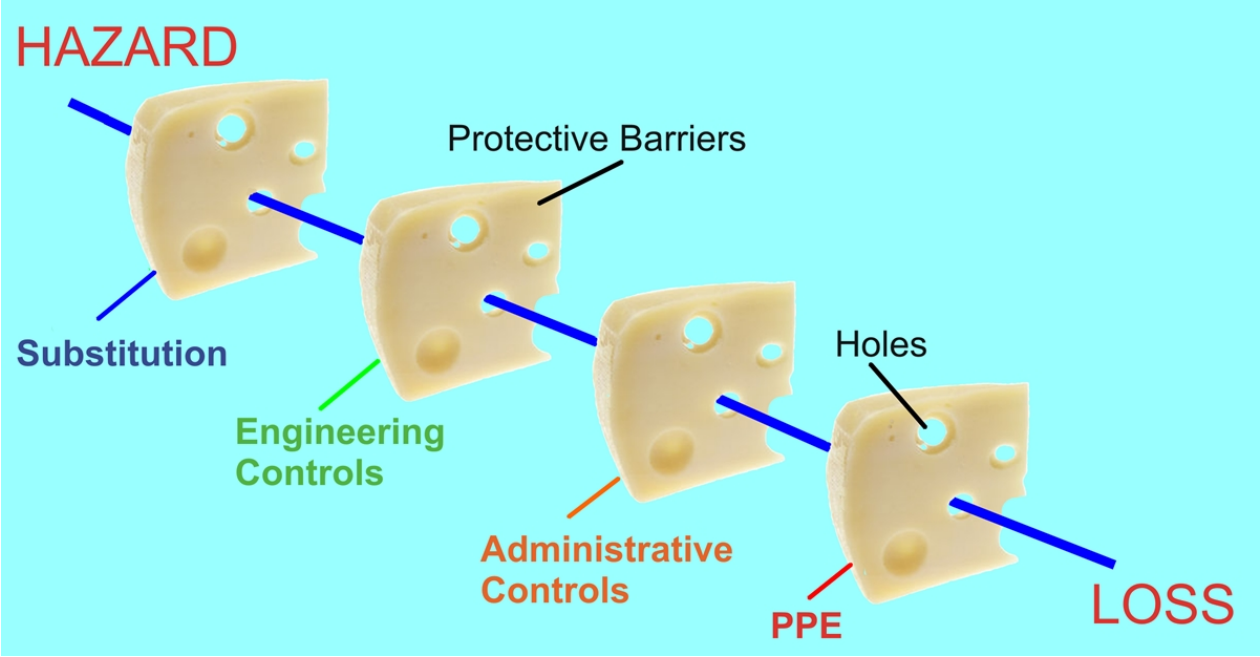
https://www.youtube.com/watch?v=kDxrQkOKUdI

Be Wise, Be Safe
For you and your love ones

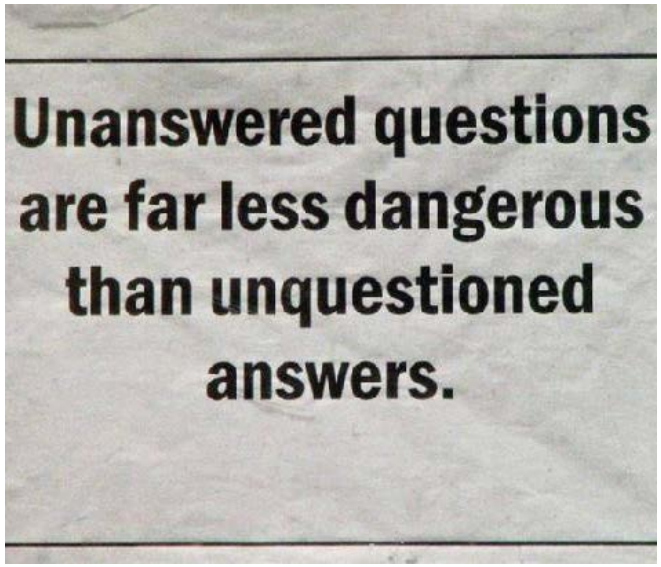
Risk Management System (RMS)



The Swiss Cheese Model of Accident Causation

Substitution

- Define your Research Objectives
- Identify the possible methodologies and paths to reach them.
- Select the one with less risks
- Talk about that with your supervisor for his/her approval.



Engineering controls

- Learn how to use them properly.
- If you have doubts, ask.
- Always use them

A induction how to operate them will be given in the tour to the labs.

Engineering Controls in the Lab

1. Diagnostic Override Panel
2. Traffic Lights and Sounder System
3. Fume Cupboard Operation
4. Air-Conditioning Operation
5. Lighting Operation
6. Process Cooling Water operation
7. Dangerous Good Cupboards operation
8. Gas Bottle Stores Extract System
9. Bench Extract System
10. Gas and Electrical Reset Panel
11. Laboratories Gas Isolation Panel
12. Gas Detectors and Audio Visual Alarm
13. Emergency off Button
14. Fire Alarm
15. Power Failure

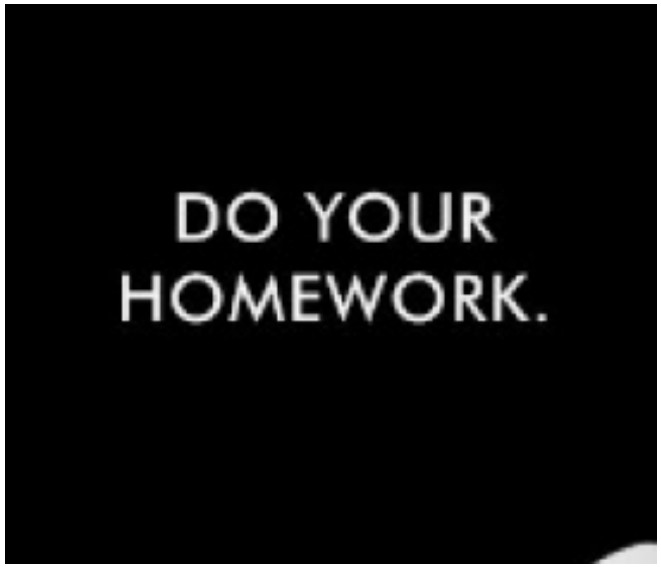
Diagnostic Override Panel (DOP)

The DOP links all the equipment in the laboratories to provide information for each of them and enables the operator to turn on or off some of the service.

The panel is directly linked to the Building Management System and controls the alarms of the laboratory.

Administrative Controls

1. Follow the Laboratory Safety Guidelines
2. Do your Hazards Management Plan
3. Be trained in safe handling, storage, and disposal of chemicals
4. Receive specialize training in the use of the analytical instruments you are going to work with.
5. Always report accident or incidents to allow the continuous improvement of our RMS.



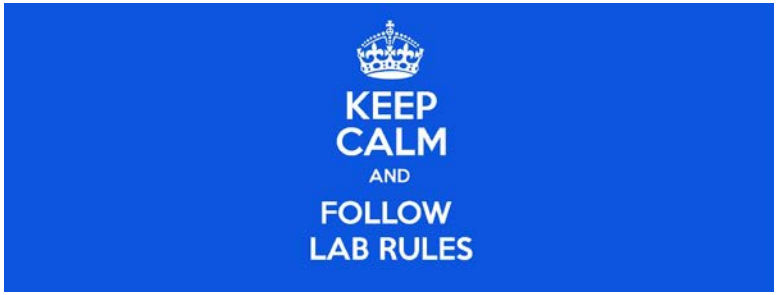
Personal Protection Equipment (PPE)

Outfit for Safety (ChemUCSD)

https://www.youtube.com/watch?v=iO3NE1MxSr0

Laboratory Safety Guidelines

https://www.youtube.com/watch?v=h8GLmc1UBVk



Hazard Management Plan

1. Identify Risks – Read your Methodologies, procedures or protocols to identified them.
2. Research about the chemicals you are using in the MSDS

   GoldFXX (Material Safety Data Sheet Database)

   http://www.library.auckland.ac.nz/databases/record/index.asp?record=chemweb
3. Identify your PPE and controls.

Safe Handling

Laboratory Techniques and Methods

Exercise

<u>7 Common Lab Accidents</u>

1. Fire
2. Heat Burns
3. Chemical Burns
4. Cuts and Scrapes
5. Contamination
6. Inhalation
7. Spills and Breaks

Discuss about their causes and how to prevent them with Safe Handling

Storage

Chemical Storage: Nine Compatible Storage Group System.

Group I Flammable Liquids
Group II Poisons - volatile
Group III Acids - Oxidizing
Group IV Acids - Organic and Mineral
Group V Bases - Liquid
Group VI Oxidizer - Liquid
Group VII Poisons - Non-volatile
Group VIII Reactives
Group IX Solids

General and Principles of Safe Chemical Storage

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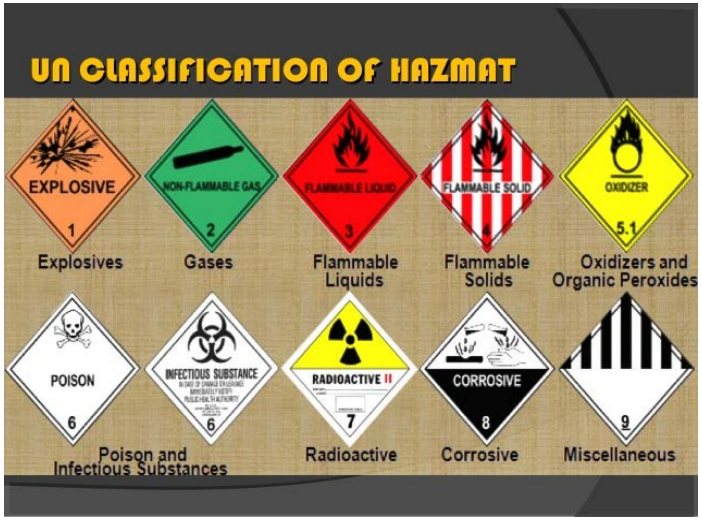
- A designated storage place for each compound.
- Each stock container of a chemical compound should be returned to that location after each use.
- Not on the bench top.
- Not in the fumehood
- Away from sun and heat
- Not under the sink
- Label chemicals properly
- Solutions????. Label.

Environmental Health & Safety

Disposal of chemicals

https://www.staff.auckland.ac.nz/en/human-resources/health-safety-and-wellbeing/health-and-safety-risk-management/chemical-safety/storage-and-disposal-of-chemicals.html



Emergency Procedures

Emergency Off Buttons (EBO)

- At the Exit doors
- On Fume Cupboards

Fire Alarm

Exit Button

Preferred Exit

Evacuation Procedures

Safety Shower

Eye Shower

First Aid

Phones

Traffic Lights and Souder System

- Green Light indicates that the laboratory is safe and activities can proceed.
- Amber Light indicates a low level alarm. No evacuation is required but investigation of the alarm by the occupants must be carried out.
- Flashing Red Light indicates a high level alarm and the occupants must evacuate the laboratories
- Red Light indicates that high level alarm has been acknowledged and the sounder has been mute but the fault is still to be rectified. Occupants cannot re-enter the laboratory until the fault has been cleared .
- Saunders are activated with a high level alarm only.

The main laboratory is fitted with green/amber/red lights and sounders. The ancillary labs are fitted with a sounder only.

PC1 Transitional Facility

The School of Environment's Environmental Chemistry Laboratory at 302-730 is an in-house quarantine facility which is licensed to receive, hold, and analyse uncleared risk goods under the Biological Products Import Health Standard.

It must operate to the requirements of PC1 containment under the MPI Biosecurity standard 154.02.17, and under a strict set of guidelines, defined in its operational manual. to facilitate the analysis of these materials within a contained environment.

WHY a TF facility?

The School of Environment participates in research activities which, at times, require the import of earth materials and environmental samples.

There are circumstances where these materials do not meet the clearance requirements of MPI import Health Standards and cannot be given the prescribed sterilisation treatment for them to be released from quarantine (often for analytical reasons)

Requirements of the facility. PC1 Containment. That all Must accomplish

1. Access is limited to authorised and approved personnel
2. Food and drink may not be brought into the laboratory nor stored in laboratory refrigerators
3. Correct PPE Shall be worn while in the laboratory (Covered shoes, lab coat, lab glasses).
4. Items such as door handles, fridges, phones and keyboards are to be decontaminated regularly
5. Work benches are to be decontaminated regularly with Approved Decontamination Agents using the correct holding times
6. Hands are to be washed before leaving the laboratory
7. Lab coats are not to be worn outside the laboratory
8. Permeable materials which could absorb spills (such as chillibins and cardboard boxes) are to be stored appropriately, and are no to be left on the floor inside the laboratory
9. All work shall be clearly labelled and identified
10. Containers of Approved decontamination agents must be labelled with concentrations and expiry dates.
11. All chemicals are stored correctly and are to be returned to where they came from
12. Fume cupboards are to be used when working with toxic, volatile, corrosive or odoriferous substances.

If you intend to become a TF user you must

Before contempling importation staff and students must **consult** with TF Manager.

All staff/students working with quarantined materials will be required to **read and understand the MPI Transitional Facility Operating Manual**. A Statement will be required to that effect that they have read and understood the requirements of the Manual will be required from each staff member/student

All staff/students who have been signed in as TF user will be required to **attend an annual refresher session** in the month prior to the annual inspection . Staff/Students that do nor attend a refresher will lose their status as TF users.

University Web Resources

- School of Environment , Health, Safety and Wellbeing
  - http://www.env.auckland.ac.nz/en/about/our-school/health-safety-and-wellbeing/laboratories.html
- School of Chemical Sciences, Health and Safety
  - http://www.chemistry.auckland.ac.nz/en/for/current-students/cs-health-and-safety.html

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