Chemical safety

Why safety at work is important at lab work?

Many of the chemical materials are:

- poisonous
- explosive
- irritating
- (radioactive)

- We don´t know all the properties of all materials – under research
- Number of chemical materials is increasing heavily

Dangers in chemical laboratory

Effects of industrial chemicals

- Local irritation
- Allergic reaction
- Narcotic effect
- Acute poisoning
- Chronic poisoning
- Carcinogenic (causing cancer)
- Teratogenic (causing fetus damage)
- Mutagenic (causing mutation)
- Interaction between different substances
- Shortened lifespan

Rare accidents

- fire
- explosion
- electrical
- radiation

Relatively common accidents

- Injuries from corrosive materials
- Eye injuries from broken glass

Most common accidents

- Skin injuries (cold/hot/corrosive materials)
- Wounds and bruises from machines and tools
- Falling/tumbling

Hazards of chemical materials

Immediate chemical hazards

- **All chemicals can be hazardous to health and wellbeing!**

- According to chemical law (744/1989, 1412/1992) health hazardous chemical is a chemical material which entering human body even in small doses causing harm to your health. → health hazardous chemicals are classified according to its effect

F

Helposti syttyvä

Mycket brandfarlig

F+

Erittäin helposti syttyvä

Ytterst brandfarlig

O

Hapettava

Oxiderande

T

Myrkyllinen

Giftig

T+

Erittäin myrkyllinen

Mycket giftig

E

Räjähtävä

Explosiv

Xn

Haitallinen

Hälsoskadlig

Xi

Ärsyttävä

Irriterande

C

Syövyttävä

Frätande

N

Ympäristölle vaarallinen

Miljöfarlig

Material safety data sheets

- Manufacturer, supplier or anyone handing over the material is responsible of giving information on the material safety issues (health, environment)

- Material safety data sheets can be found in paper and pdf form from lab.

Avoiding hazards

- Care, rationality, cleanliness, knowing what you are doing, reasonable caution and prevention of dangerous situations

- **Read the MSDS!**

Cleanliness and order:

- Dry materials immediately if spilled on the floor
- Keep the tools and desks clean
- Clean and dry the material from the outer surface of the container

Use protective equipment:

- Always use lab coat at lab
- Always use safety goggles when working with materials/equipment
- Whenever needed, use lab gloves and respiratory protection
- Handling of materials in well ventilated areas (fume hood)

- No open fire close to flammable materials
- No contact lenses, if possible
- Find out where are alarms, emergency showers, fire extinguishers and first aid kit and learn how to use them
- No eating or drinking at labs
- Wash your hands when leaving lab

Handling of laboratory waste

- Properly process waste immediately when occurs
- Less material, less waste
- Several materials can be re-used but those have to be stored separately
- When taking material from stock container never put it back to same container
- Never lead to drain nothing but harmless materials
- Chemical waste should be marked. Best to collect them to original packaging.

Pregnancy

- Lab work and materials effect on offspring progress and pregnancy has been well researched.
- Solvent content less than 10 % of HTP is considered safe
- Occupational safety professionals map the dangers at work
- Pregnant can ask to be transferred to tasks where exposure to hazards is minimized
- If minimum hazards tasks are not possible lab work is not recommended
- Doctor should be consulted before lab work
- Let the lecturer know if you are pregnant so safe lab work can be ensured