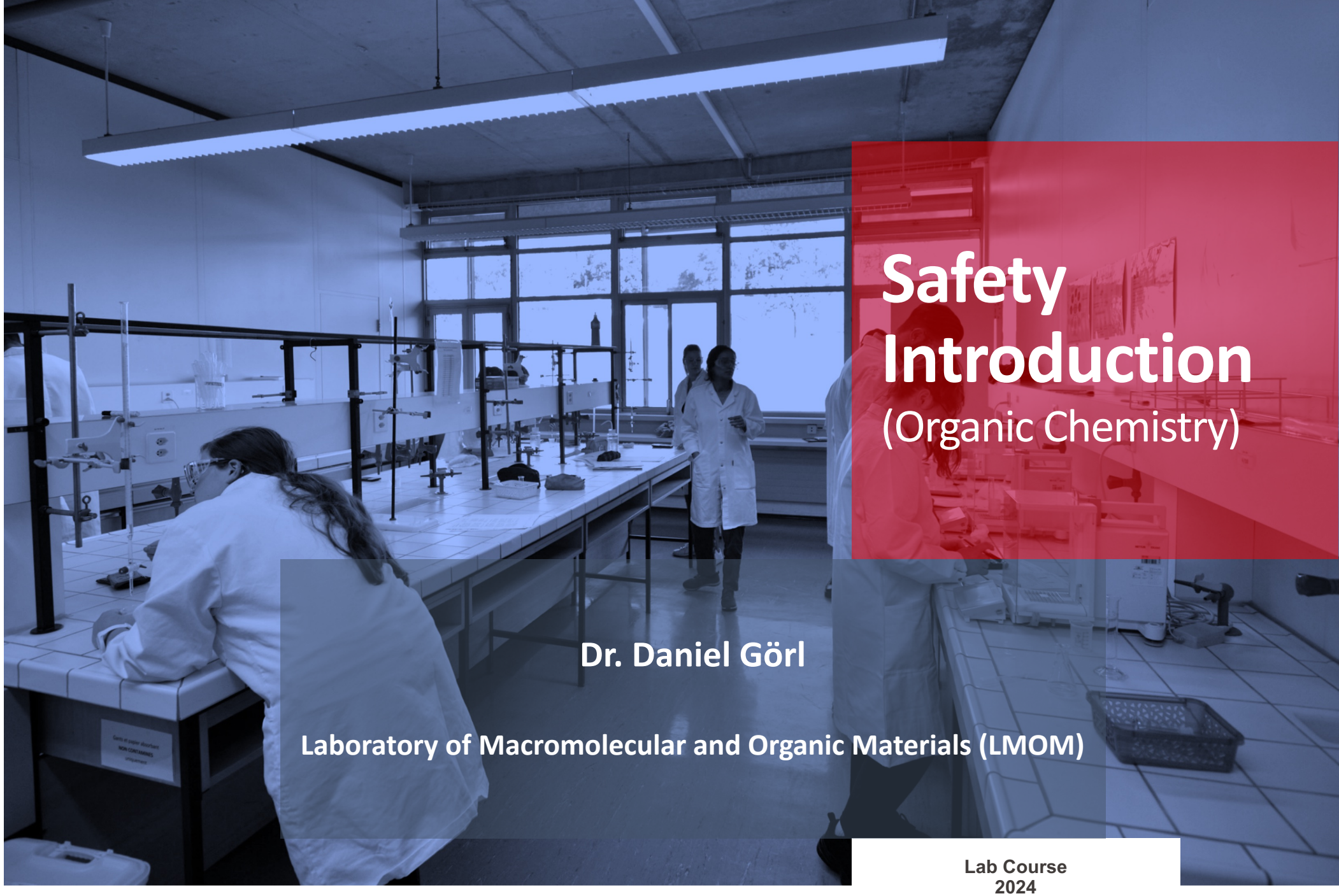


Safety Introduction
(Organic Chemistry)

Dr. Daniel Görl

Laboratory of Macromolecular and Organic Materials (LMOM)

Lab Course
2024

School of Engineering
Institute of Materials
Laboratory of Macromolecular
and Organic Materials

Course Schedule

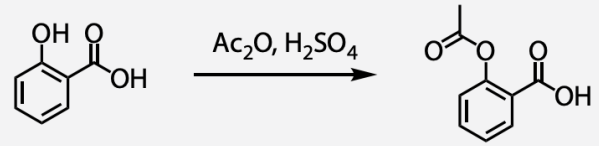
Date	11.9	18.9	25.9.	2.10.	9.10.	16.10.	23.10.	30.10.	6.11.	13.11.	20.11.	27.11.	4.12.	11.12.	18.12.
8–9							fall break				Rctn 1	Rctn 2	Rctn 3		
9–10	Announc.	2.3	2.5	3.2	3.2	4.3		4.5	4.6	5.1	A	A	A	5.2	5.3
10–11	1	2.3	2.5	3.2	4.1	4.3		4.5	4.7	5.1	A	A	A	5.2	5.4
11–12	2.1	2.4	3.1	3.2	4.2	4.4		4.5	4.8	5.1	A	A	A	5.3	5.4
12–13	(Ana III)	(Ana III)	(Ana III)	(Ana III)	(Ana III)	(Ana III)		(Ana III)	(Ana III)	(Ana III)	(Ana III)	(Ana III)	(Ana III)	(Ana III)	(Ana III)
13–14															
14–15	2.2	2.5	3.1	(ES1)	(ES2)	(ES3)		(ES4)	(ES5)	(ES6)	Recryst.	MS	NMR	(ES7–8)	(ES9–10)
15–16	2.2	2.5	3.1						Safety		A	A	A	(ES7–8)	(ES9–10)
16–17									Safety		A	A	A		
17–18			(ES1)	(ES2)	(ES3)	(ES4)		(ES5)	(ES6)	(ES7)	(ES8)	(ES9)	(ES10)		

In-person class | exercise session | laboratory (UNIL)

Lab Course Overview and Objectives

week 1

- **synthesis of Aspirin**

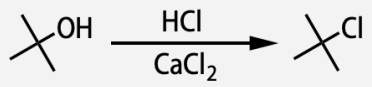


corrosive

week 2

- **synthesis of *tert.*-butyl chloride**

corrosive

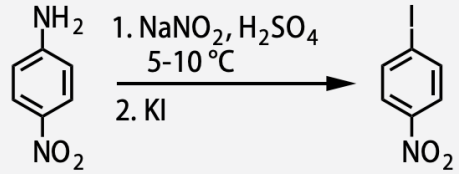


flammable **flammable**

week 3

- **Sandmeyer reaction**

corrosive

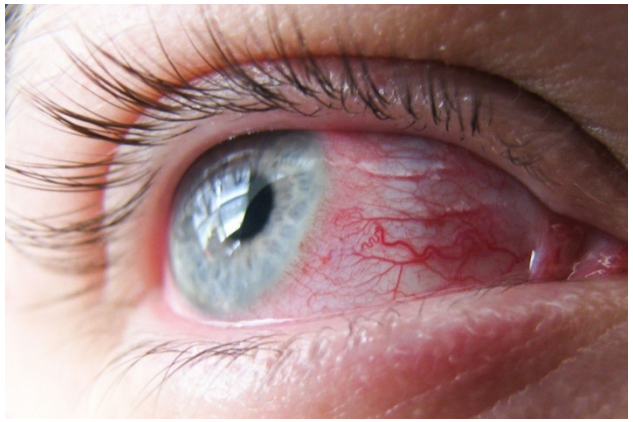


toxic, carcinogenic

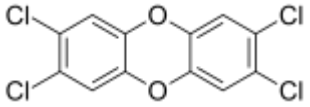
steps of organic chemical synthesis:
preparation, stoichiometric calculations, start of the reaction, work-up, purification, analysis, documentation

safe handling of toxic, corrsosive, harmful chemicals is part of this lab course!

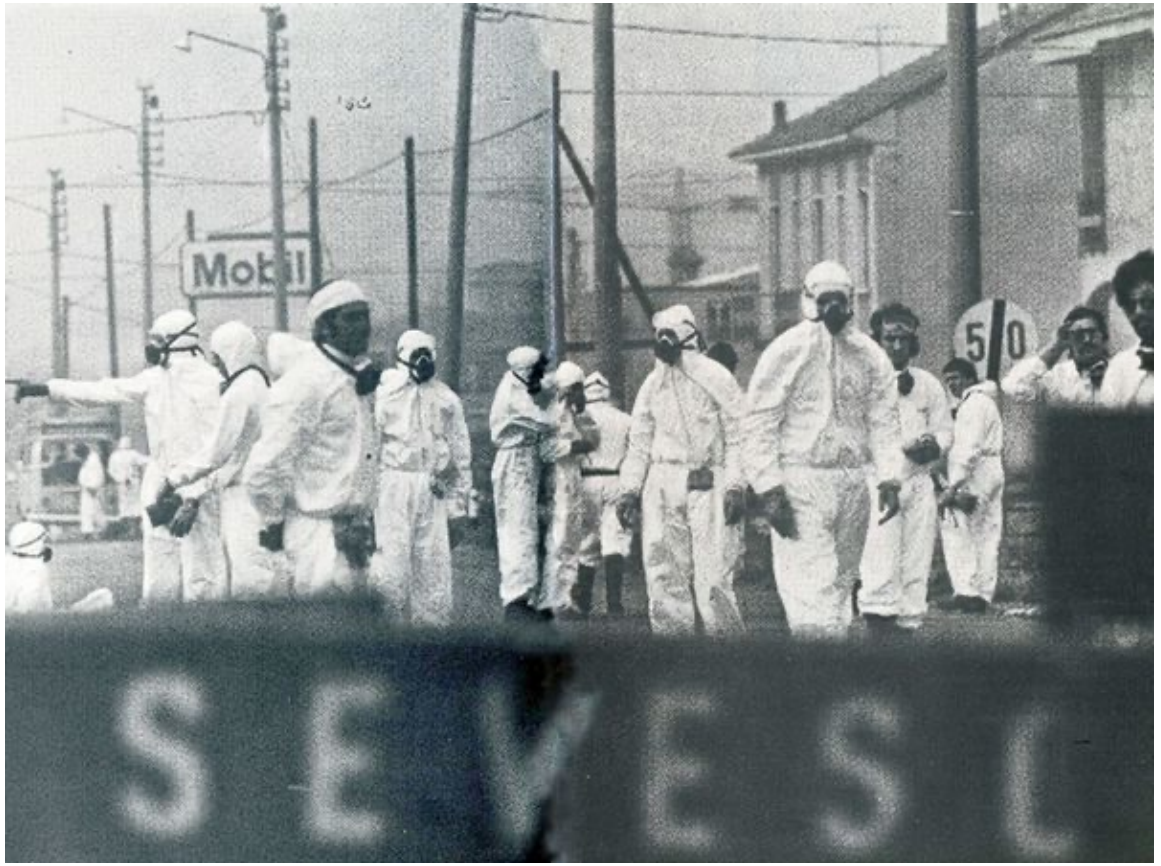
Chemistry can be Dangerous



Chemistry can be Deadly



TCDD
(2,3,7,8-tetrachlorodibenzo-*p*-dioxin)



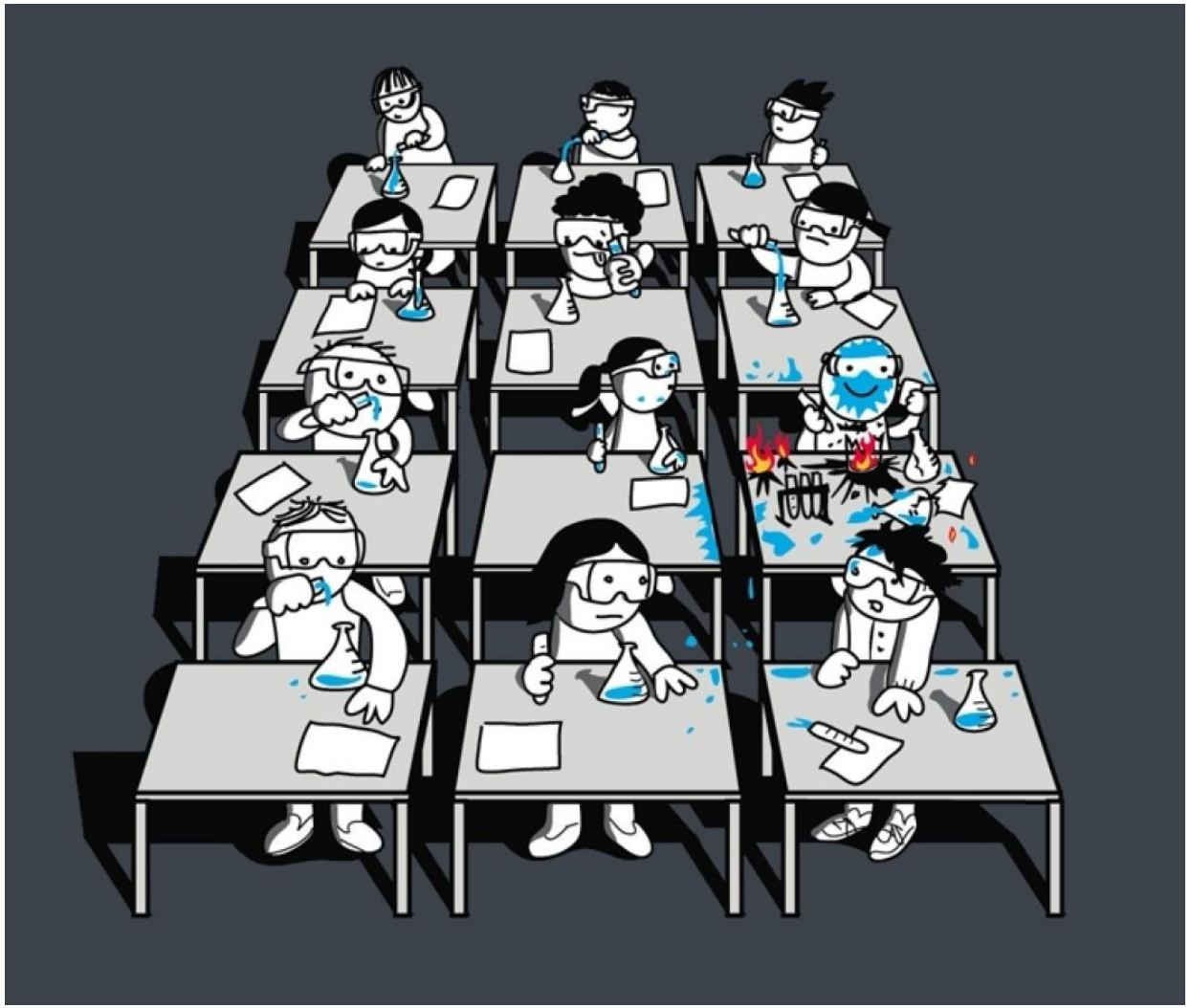
- one of the biggest man-made environmental disasters
- the beginning of standardized safety regulations

Seveso 1976: industrial accident due to the overheating of a reactor manufacturing 2,4,5-trichlorophenol.

Chemistry can be Devastating

Beyrouth 2020: Explosion of 2 750 tonnes ammonium nitrate stored in shed.

DANGERS for oneself AND for others…



Work while minimizing risks!

Legal Aspects

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Fedlex
La plateforme de publication du droit fédéral

813 Produits chimiques

813.1	Loi fédérale du 15 décembre 2000 sur la protection contre les substances et les préparations dangereuses (Loi sur les produits chimiques, LChim)
813.11	Ordonnance du 5 juin 2015 sur la protection contre les substances et les préparations dangereuses (Ordonnance sur les produits chimiques, OChim)
813.112.1	Ordonnance du 18 mai 2005 sur les bonnes pratiques de laboratoire (OBPL)
813.113.11	Ordonnance du DFI du 28 juin 2005 relative à la personne de contact pour les produits chimiques
813.12	Ordonnance du 18 mai 2005 concernant la mise sur le marché et l'utilisation des produits biocides (Ordonnance sur les produits biocides, OPBio)
813.121	Ordonnance du DFI du 15 août 2014 sur les règles d'exécution relatives à l'ordonnance sur les produits biocides (Ordonnance d'exécution du DFI sur les produits biocides)
813.131.21	Ordonnance du DFI du 28 juin 2005 sur les connaissances techniques requises pour la remise de certaines substances et préparations dangereuses
813.132	Produits chimiques qui font l'objet d'un commerce international →814.82
813.153.1	Ordonnance du 18 mai 2005 sur les émoluments perçus en application de la législation sur les produits chimiques (Ordonnance sur les émoluments relatifs aux produits chimiques, OEChim)

https://www.fedlex.admin.ch/eli/cc/2004/724/fr

https://www.fedlex.admin.ch/eli/cc/2015/366/fr

Loi sur les produits chimiques, LChim

- **Art. 8 Devoir de diligence**

Quiconque utilise des substances ou des préparations doit tenir compte de leurs propriétés dangereuses et prendre les mesures nécessaires à la protection de la vie et de la santé. Il doit notamment tenir compte des informations fournies à ce sujet par le fabricant.

LChim

- **Art. 25 Mesures dans les entreprises et les établissements d'enseignement**

[1] Quiconque utilise des substances ou des préparations à titre professionnel ou commercial est tenu de prendre toutes mesures utiles à la protection de la vie et de la santé du personnel et dont la nécessité a été démontrée par l'expérience, que l'état de la technique permet d'appliquer et qui sont adaptées aux conditions de l'entreprise. Sous réserve des art. 42 et 45, l'exécution de la présente disposition est régie par la loi du 13 mars 1964 sur le travail[1] et par la loi du 20 mars 1981 sur l'assurance-accidents[2].

Ordonnance sur les produits chimiques, OChim

- **Art. 2 Définitions et droit applicable**

En outre, on entend par:

a. *utilisateur professionnel*:

[…]

2. est également réputé utilisateur professionnel:

- toute personne physique ou morale qui se procure en Suisse des substances, des préparations ou des objets en vue de les employer dans le cadre d'une formation ou à des fins de recherche,
- toute personne morale qui se procure en Suisse des substances, des préparations ou des objets en vue de les employer dans le cadre d'une activité d'intérêt général;

Chemical Hazards

…and how to prevent or mitigate them

Management of chemicals

- Chemicals can have hazardous effects on your health through inhalation, ingestion or in contact with your skin.

GHS pictograms

Exploding bomb Identifies chemicals with the following hazards : ▪ Explosives ▪ Self-reactive ▪ Organic peroxide	**Gas Cylinder** Identifies chemicals with the following hazards : ▪ Gas under pressure (compressed gas, liquefied gas, dissolved gas and refrigerated liquefied gas)	**Health Hazards** Identifies chemicals with the following hazards : ▪ Carcinogenicity ▪ Mutagenicity ▪ Reproductive toxicity ▪ Respiratory sensitizer ▪ Target organ toxicity ▪ Aspiration toxicity
Flame Identifies chemicals with the following hazards : ▪ Flammable ▪ Pyrophoric ▪ Self-heating ▪ Emits flammable gas in contact with water ▪ Self-reactive ▪ Organic peroxides	**Corrosion** Identifies chemicals with the following hazards : ▪ Skin corrosion ▪ burns ▪ Eye damage ▪ Corrosive to metal	**Skull and Crossbones** Identifies chemicals with the following hazards : ▪ Acute toxicity (fatal or toxic)
Flame over Circle Identifies chemicals with the following hazards : ▪ Oxidisers	**Exclamation mark** Identifies chemicals with the following hazards : ▪ Irritant (skin and eye) ▪ Skin sensitizer ▪ Acute toxicity (harmful) ▪ Narcotic effects ▪ Respiratory tract infection ▪ Hazardous to ozone layer	**Environment** Identifies chemicals with the following hazards : ▪ Aquatic toxicity *(this symbol is not mandatory)*

Physical hazards | Health Hazards | Environmental Hazards

- Chemicals can cause fire or explosion, when stored incorrectly.
- Store chemicals according to their GHS pictograms, in separate storage places according to their compatibilities. Contact OHS.

go.epfl.ch/chemical-storage

Combinations and Incompatibilities

important for compound storage

can be stored together
not next to each other
not in the same closet

acids and bases must be separated

							
	☺	☺	☺	☺	😐	☹	☹
	☺	☺	☺	☺	😐	☹	☹
	☺	☺	☺	☹	☹	☹	☹
	☺	☺	☹	☺	☹	☹	☹
	😐	😐	☹	☹	☺	☹	☹
	☹	☹	☹	☹	☹	☺	☹
	☹	☹	☹	☹	☹	☹	☺

Nom du fabricant

Importateur ou distributeur

LES PRODUITS CHIMIQUES SA - 12 rue Charteux - 75010 Paris

MÉTHANOL

Nom du produit

Substance ou mélange

Pictogrammes de danger

Mention d'avertissement

DANGER

Mentions de danger

H25	Liquides et vapeurs très inflammables
H301	Toxique en cas d'ingestion
H311	Toxique par contact cutané
H331	Toxique par inhalation
H370	Risque avéré d'effets graves pour les organes
P210	Tenir à l'écart de la chaleur/des étincelles/des flammes nues/des surfaces chaudes. Ne pas fumer

Conseils de prudence

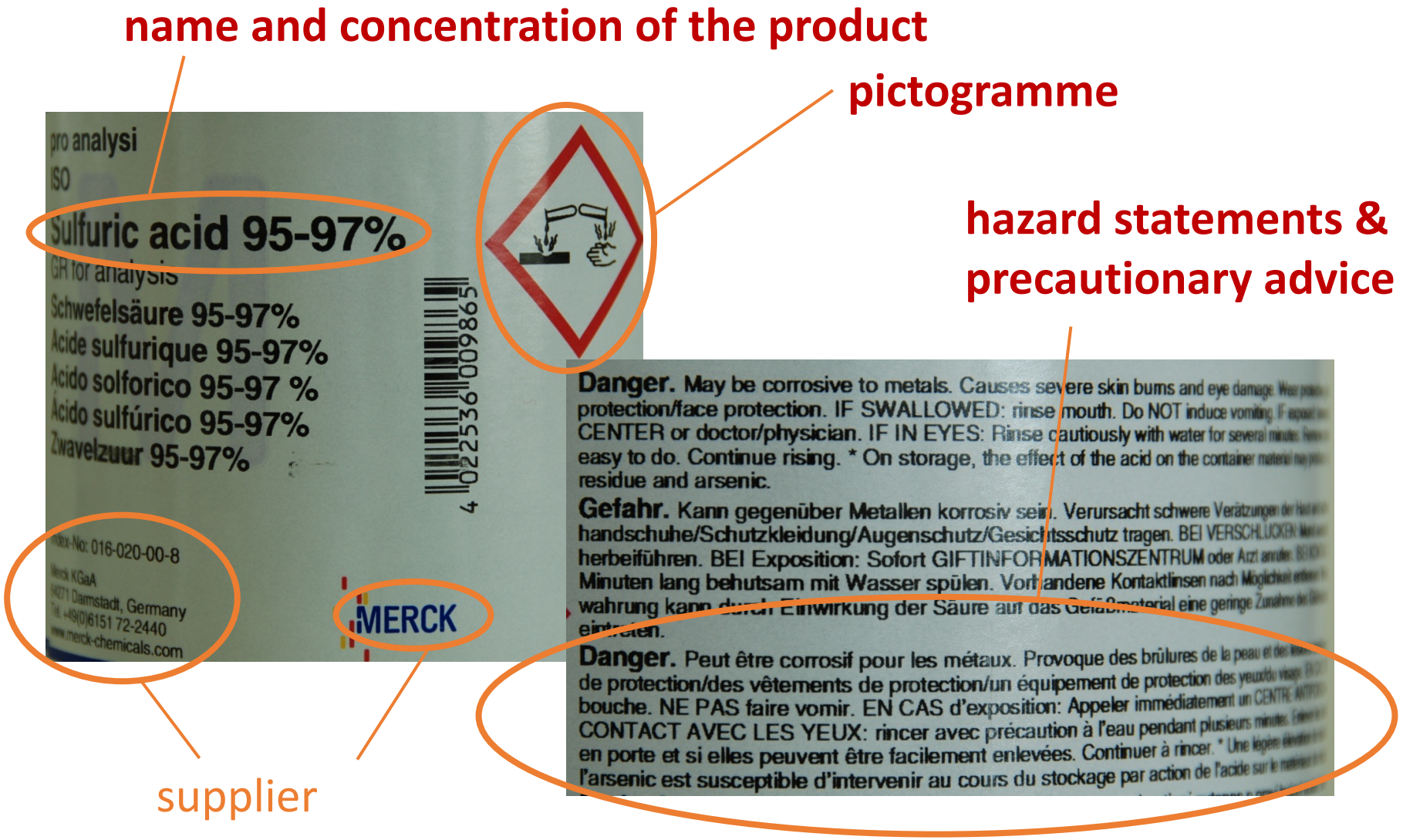
P403/233	Stocker dans un endroit bien ventilé. Maintenir le récipient fermé de manière étanche
P280	Porter des gants de protection/des vêtements/un équipement de protection des yeux/du visage
P302/352	En cas de contact avec la peau : laver abondamment à l'eau et au savon
P301/310	En cas d'ingestion : appeler immédiatement le centre antipoison ou un médecin
P405	Garder sous clé

N° européen d'identification du produit (CE)

N° CE : 200-659-6 - N° CAS : 67-56-1

N° identifiant du Chemical Abstract Service (CAS)

Safety data sheets: reminder on packaging



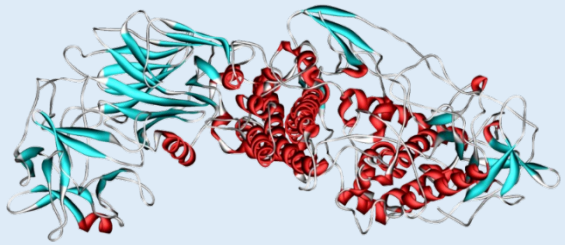
Incinerations (chemical)

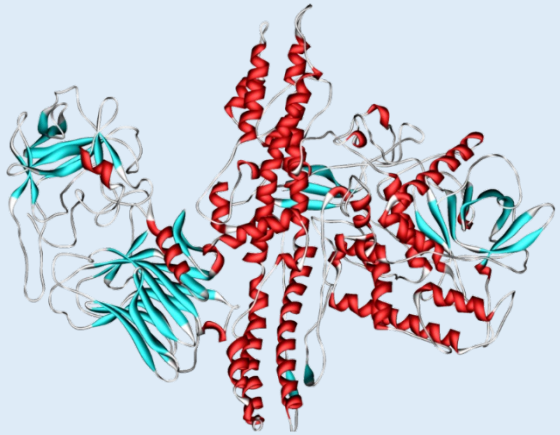
- corrosive
- irritant

Toxicity

- dose
- Chronic exposure
- LD_{50}

- H300 Fatal if swallowed
- H301 Toxic if swallowed
- H310 Fatal by skin contact
- H311 Toxic by skin contact
- H330 Fatal if inhaled
- H331 Toxic by inhalation





Botulinum toxin

LD_{50} = 1 ng/kg

CO

carbon monoxide

LD_{Lo} = 5000 ppm / 5 min (inhalation)

HCN

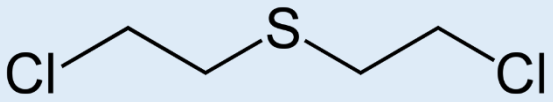
cyanic acid

LD_{Lo} = 357 ppm / 2 min (inhalation)

^{210}Po

Polonium

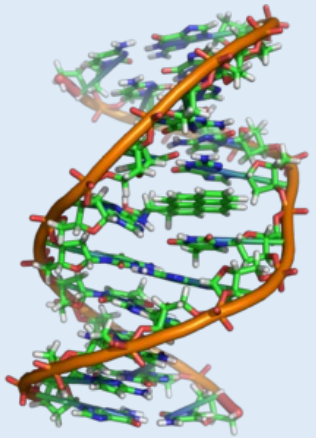
LD_{50} = 89 ng



mustard gas

LC_{t50} = 900 mg·min/m^3

Health Risks



- Cancers
- Genetic mutations
- Effect on Reproduction
- Sensitization (allergen)
- Chronic exposure

- H304 May be fatal if swallowed and enters airways
- H334 May cause allergic or asthma symptoms or breathing difficulties if inhaled.
- H340 Can cause genetic abnormalities
- H341 Susceptible to causing genetic abnormalities
- H350 May cause cancer
- H351 Suspected of causing cancer
- H360 May harm fertility or the fetus
- H361 Suspected of damaging fertility or the unborn child
- H362 May be harmful to breast-fed babies
- H370 Proven risk of serious damage to organs
- H371 Suspected risk of serious damage to organs
- H373 May cause damage to organs through repeated or prolonged exposure

Pregnancy?

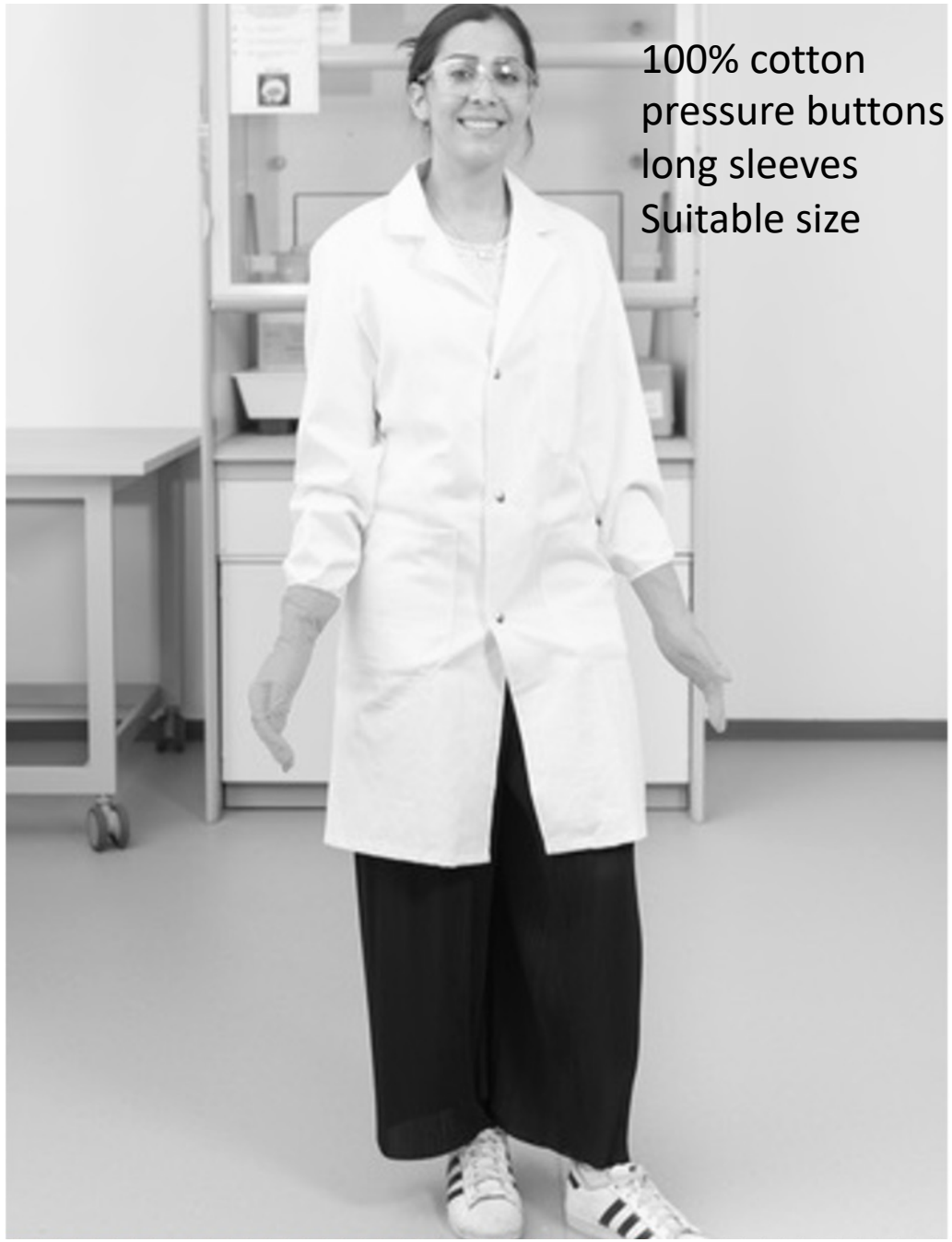
Mandatory to notify the TP manager (Holger or Daniel)!

Pollution

- Persistent in the environment
- Risk for fauna and/or flora

No chemicals in the sink!

Protective Measures



100% cotton
pressure buttons
long sleeves
Suitable size

Mandatory standard PPE in a lab

PPE personal protective equipment

- **Cotton lab coat** with pressure buttons and long sleeves !
- **Safety glasses**: EPFL offers medical safety glasses for personnel who work at least 50 % in a lab (securite.epfl.ch/ppe).
- **Gloves** adapted to your work; ex. work with hot surfaces, cryogenics, chemicals.
- Closed shoes, covered legs, attached long hair.
- Don't use contact lenses.

Take off your **lab coat and gloves**, when you leave the lab to avoid contamination !

Lab coats are available at www.tablia.ch

No lab coats outside the lab area!

PPE: Choose your gloves according to the chemicals you will use or manipulation you have to do !

Gloves adapted to your work: hot surfaces, cryogenics, chemicals



Choose your gloves **according to the chemical** you work with


EN ISO 374-1 2016 / TYPE A

UVWXYZ

EN ISO 374-1 2016 / TYPE B

XYZ

EN ISO 374-1 2016 / TYPE C

A methanol	G diethylamine	M nitric acid 65%
B acetone	H tetrahydrofuran	N acetic acid 99%
C acetonitrile	I ethyl acetate	O ammonia 25%
D dichloromethane	J n-heptane	P hydrogen peroxide 30%
E disulphur of carbon	K caustic soda 40%	S fluorhydric acid 40%
F toluene	L sulphuric acid 96%	T formaldehyde 37%

2hands https://www.2mains.ch/en/cours

Gloves

Chemical resistance

Limited protection

time, glove thickness, temperature, concentration

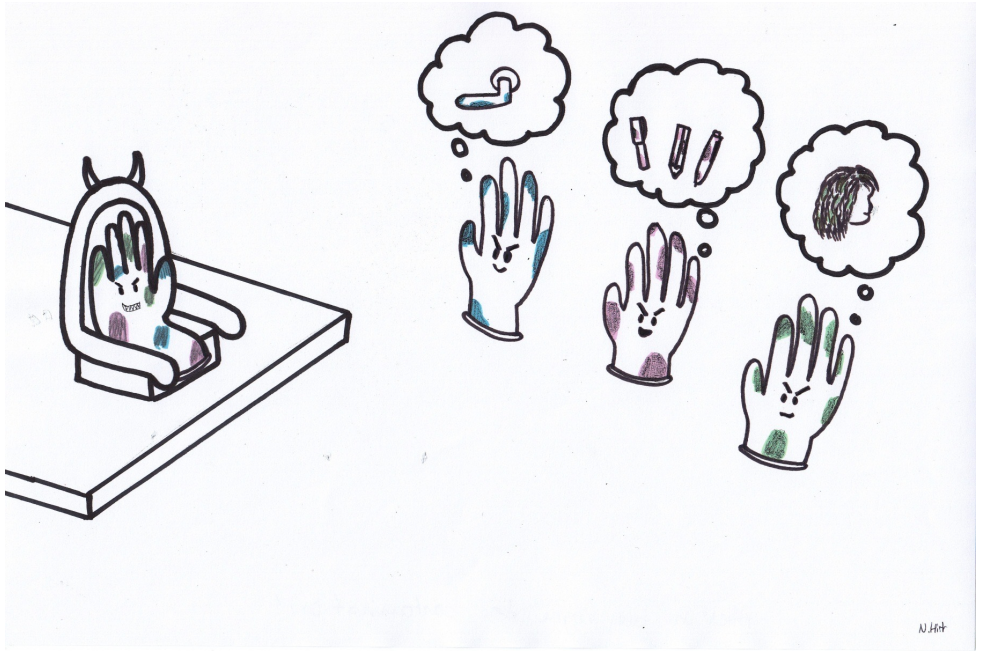
e.g. nitrile gloves

Produits chimiques (synonymes)	Gants LLG *standard*
Acide acétique (10%) (acide éthanoïque)	Niveau 6
Acétone (2-propanone)	x
Acétonitrile (cyanure de méthyle, ethanenitrile)	x
Amide acrylique (40 %), (acrylamide)	Niveau 6
Hydroxyde d'amonium (25 %)	A
Chlorure de benzalkonium (ADBAC)	n.t.
Chlorhexidine gluconate + éthanol + eau	n.t.
Chloroforme (trichlorométhane)	x
Cyclohexanol (hexalin / à 23°C)	Niveau 3
Dichlorométhane (Chlorure de méthylène, Fréon 30)	x
Diéthylamine (DEA)	x
Ether diéthylique (oxyde de diéthyle, éthoxyéthane)	x
Diméthylsulfoxyde (DMSO)	x
Ethanol (20%) (alcool éthylique)	Niveau 6
Ethanol (40%) (alcool éthylique)	Niveau 1
Ethanol (70%) (alcool éthylique)	Niveau 1
Ethanol (80%) (alcool éthylique)	A
Ethanol p.a. (alcool éthylique)	A
Bromure d'éthidium (1%) (bromure d'homidium)	Niveau 6
Acétate d'éthyle (éthanoate d'éthyle)	A
Formaldéhyde (37%) avec méthanol (10%) (formol, aldéhyde formique, méthanal)	Niveau 3
Essence (naphta lourd, b.p. 150 -190 °C)	x
Glutaraldéhyde (5%) (pentane-1,5- dial, glutaral)	Niveau 6
Acide chlorhydrique (36%)	Niveau 2
Acide fluorhydrique (40%)	n.t.
Alcool isopropylique (40%) (2-Propanol, isopropanol, IPA)	Niveau 1
Alcool isopropylique (70%) (2-Propanol, Isopropanol, IPA)	Niveau 1
Alcool isopropylique p.a. (2-Propanol, isopropanol, IPA)	Niveau 1
Méthanol (5%) (alcool méthylique)	Niveau 6
Méthanol p.a. (alcool méthylique)	A
N-heptane	X
N-hexane	A
Acide nitrique (10%)	Niveau 6
Acide nitrique (36%)	A
Acide nitrique (50%)	A
Phénol (10%) (acide carbolique, hydroxybenzène)	A
Phénol (80%) (acide carbolique, hydroxybenzène)	A
Acide phosphorique (30%) (acide orthophosphorique)	Niveau 6
Hydroxyde de potassium (30%) (potasse, soude)	Niveau 6
Hydroxyde de sodium (30%) (soude caustique, soude)	Niveau 6
Hydroxyde de sodium (40%) (soude caustique, soude)	Niveau 6
Acide sulfurique (96%) (vitriol)	A
Toluène (méthylbenzène, toluol, phénylméthane)	x
Trichlororéthane (méthylchloroforme, trichlorure d'éthyle)	x
Xylène (diméthylbenzène, xylol)	x

X non recommandé
A recommandé pour les éclaboussures uniquement – changer les gants immédiatement après contact
Niveau 1 recommandé pour un contact court de max 30 min
Niveau 2 recommandé pour un contact 60 min max
Niveau 3 recommandé pour un contact 120 min max
Niveau 4 recommandé pour un contact 240 min max
Niveau 5 recommandé pour un contact 480 min max
Niveau 6 recommandé pour un contact au delà de 480 min
n.t. non testé, pas de données disponibles

Contamination: **change your gloves frequently!**

Gloves



⇒Only when necessary

⇒ Only for the duration of the exhibition

⇒ Cleaning your hands (water + soap) after use

P262 Avoid contact with eyes, skin or clothing.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

No gloves outside the lab area!

Safety Glasses

- **Dangerous: contact lenses in the lab!**

⇒ use medical glasses or over-glasses

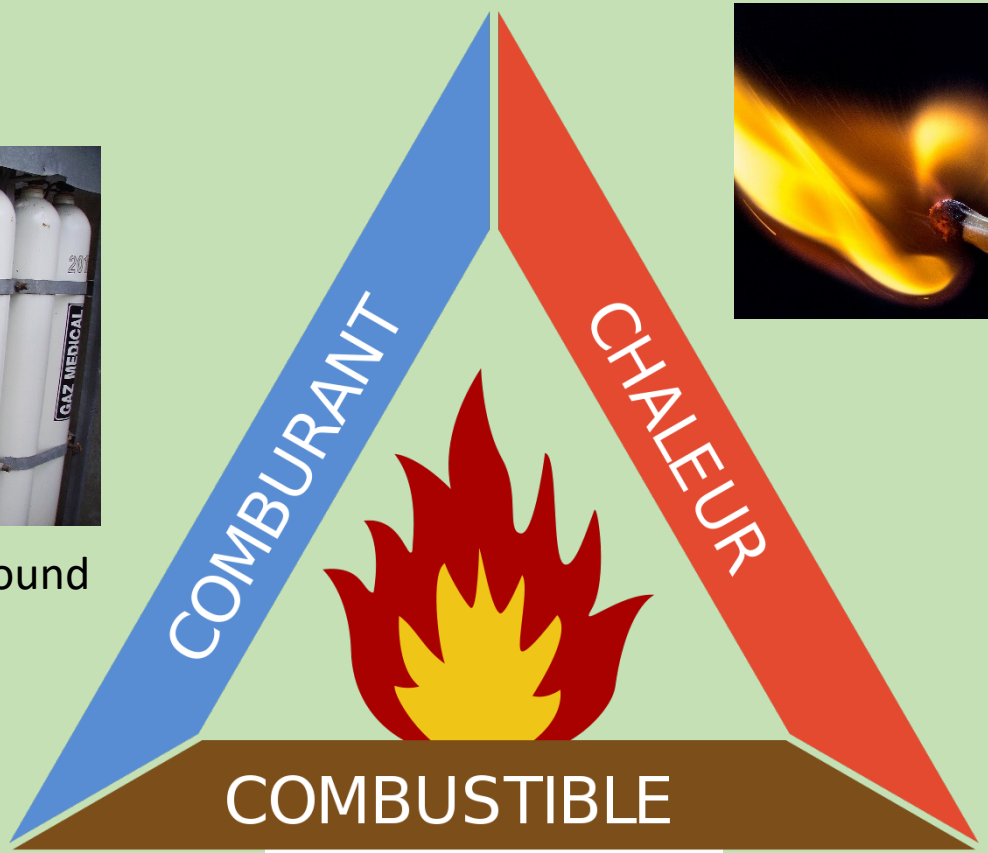
Otherwise, fully closed protective glasses

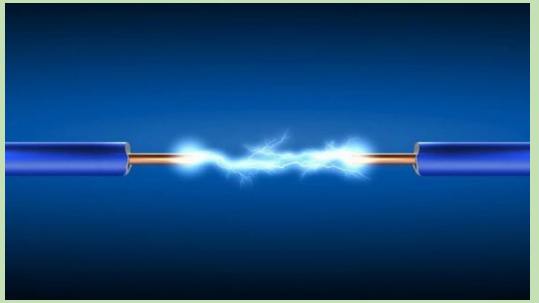
Physical Hazards

…and how to prevent or combat them

Fire

Oxygen and/or other compound





flash and inflammation point;
auto-ignition temperature

Types of fire and extinguishers

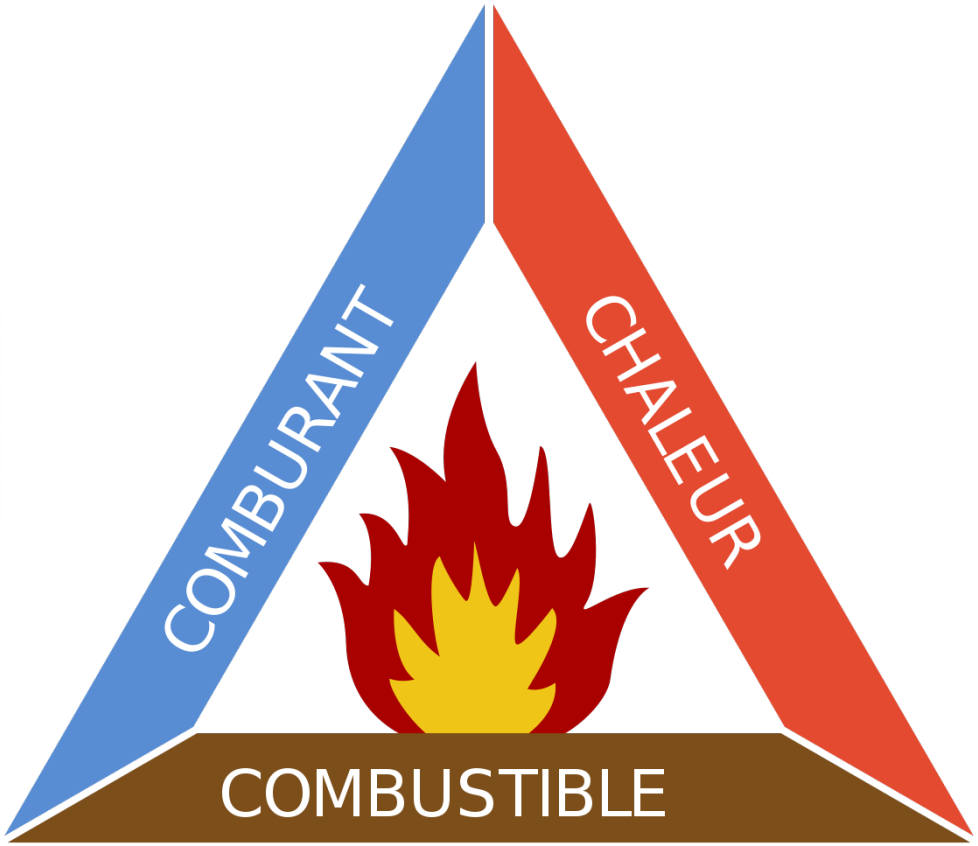
Class B fire (hydrocarbons, solvents, gasoline, alcohols, greases, oils, paints, etc.)
Flames from flammable liquefiable liquids or solids.
Type of fire extinguisher: powder, gas, foam

Class C fire (butane, propane, acetylene, natural gas, manufactured gas)
Flammable gas fire.
Extinguishing: closing the valve

Class D fire (Al powder, phosphorus, magnesium powder, sodium, titanium, etc.)
Metal fires.
Extinction: dry sand

https://fr.wikipedia.org/wiki/Classe_de_feux
https://www.cbm-services.ch/types-de-feu

Fire extinguishers



In the labs:

CO2 extinguishers

Fire blanket

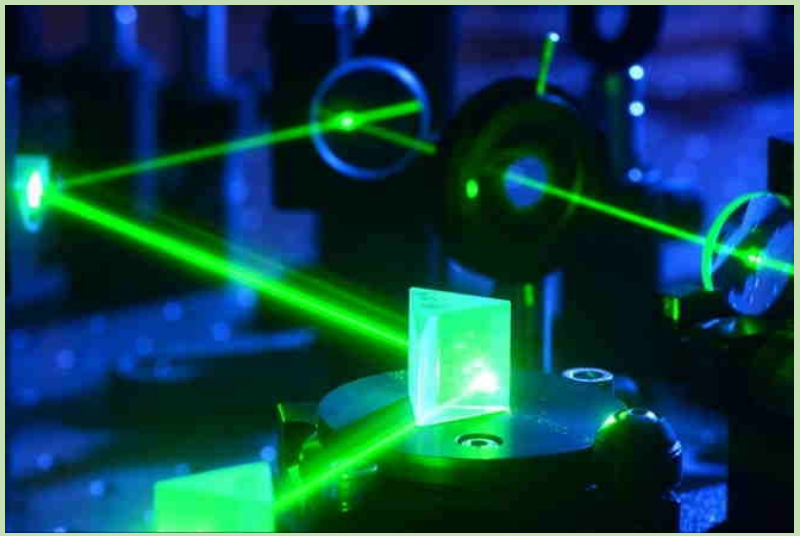
Sand

Burns (heat)

hot plate

- hot glassware
- hot steam

oven



laser

cold

e.g. liquid nitrogen

En fonction
des dangers…

Cutoffs

- broken glassware
- syringe needles
- Sharp metal
- tools

Replace broken or chipped glassware!

Syringe use

Do not reuse syringe needles!

AVOID the one hand method to recap

First, place cap on a level horizontal surface; gently slide needle half-way into cap...

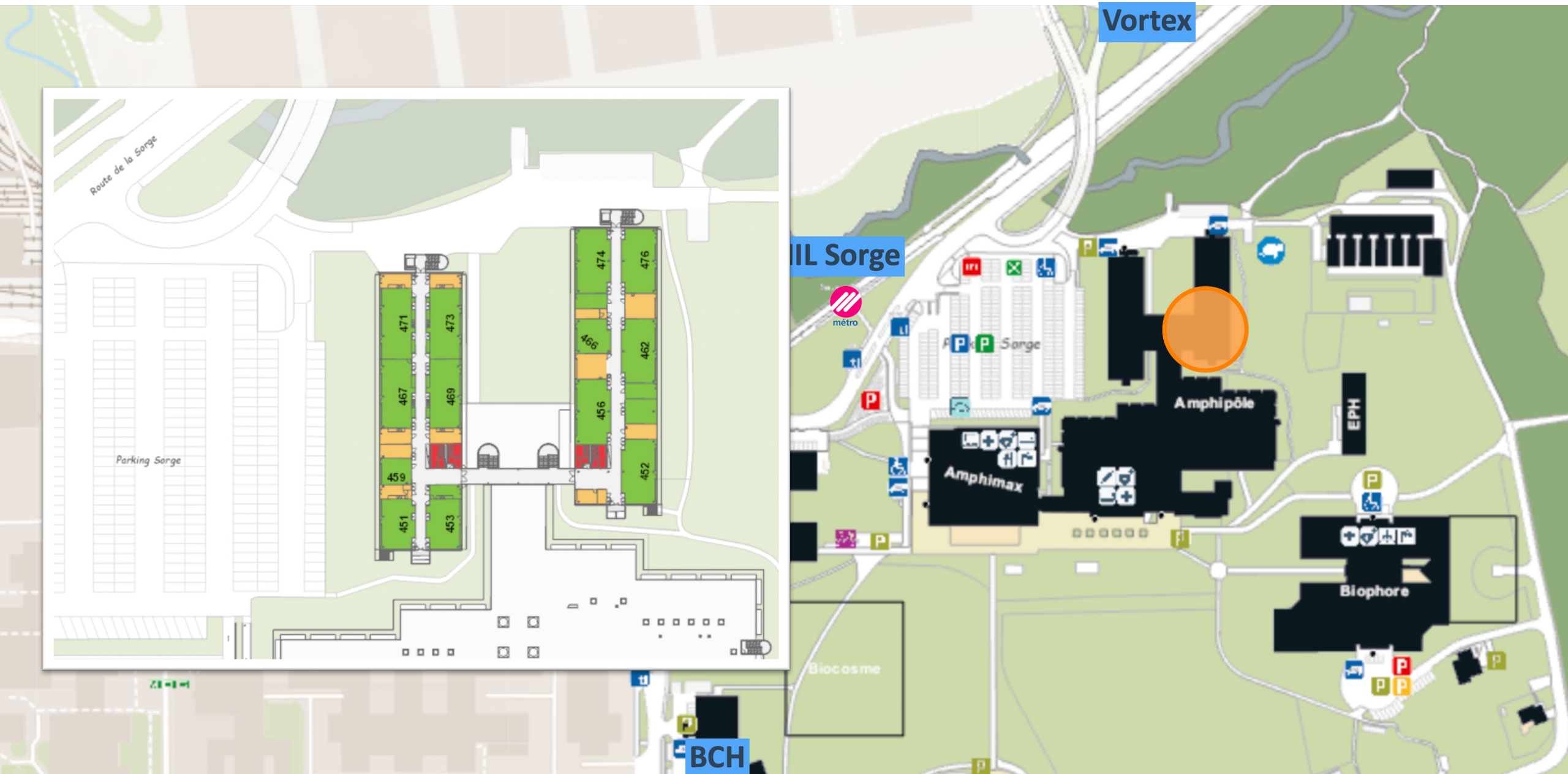
Then, slowly tip up needle end of the device and allow cap to slide over needle...

Finally, use the thumb of the hand holding the device to secure the cap on the syringe.

Don’t work with a closed reaction apparatus!

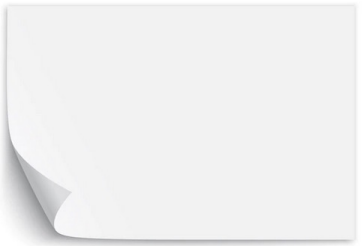
Entrée au laboratoire

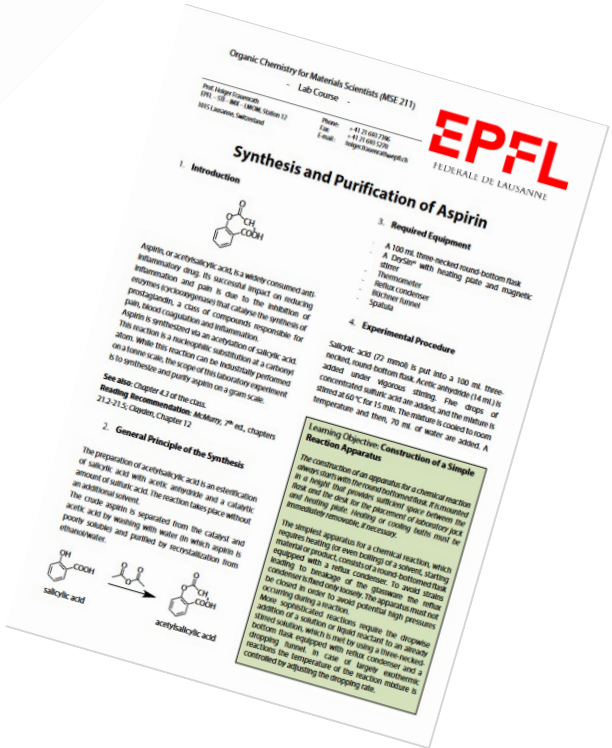
Lab Course in the Amphipol Building (452, 456, 462)



In the lab…

Go into the laboratory with a minimum of belongings





Lockers

Only for the duration of the TP!

For large objects, ask the technical team!

Bring it with you!

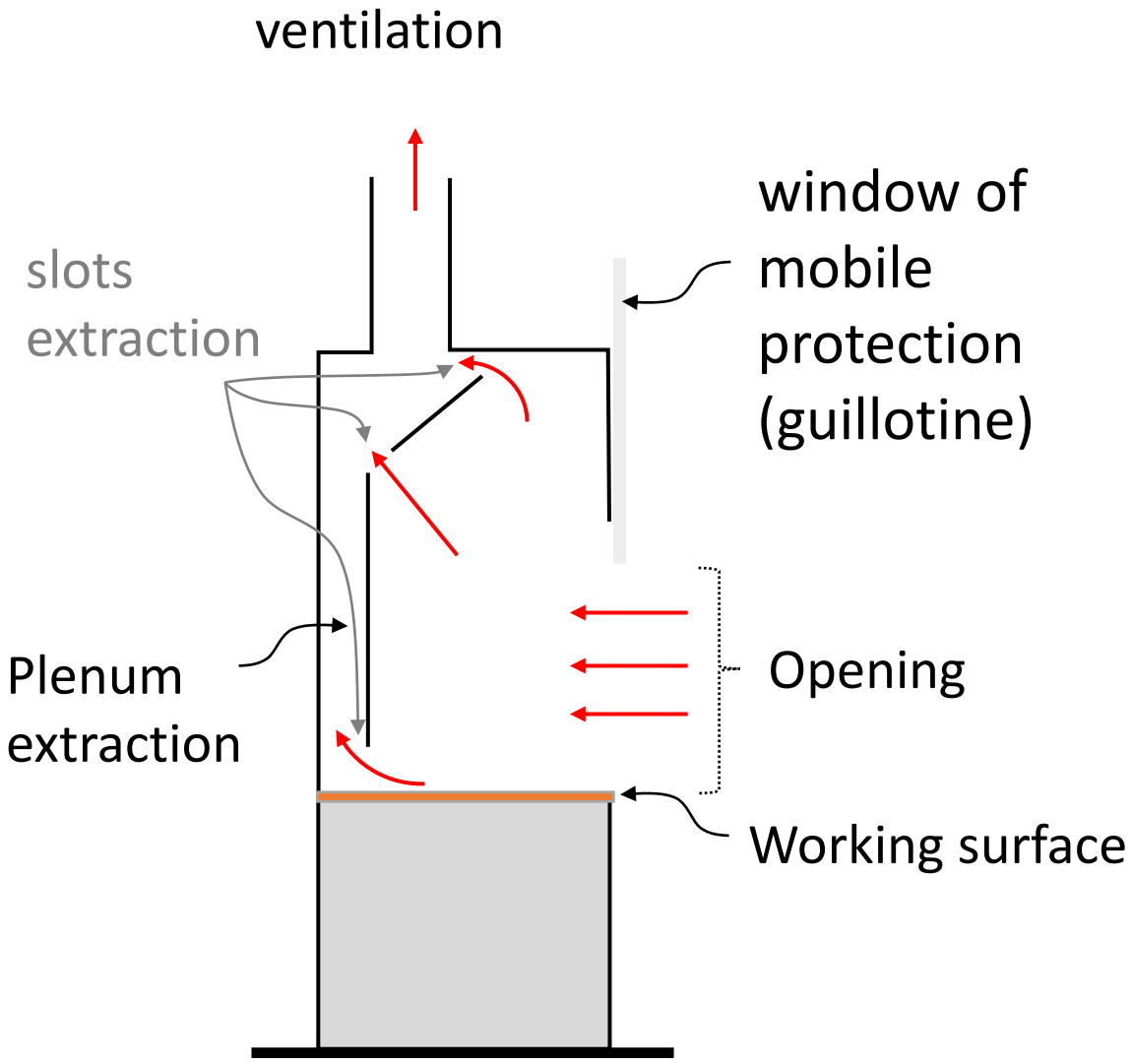
In the lab

working area

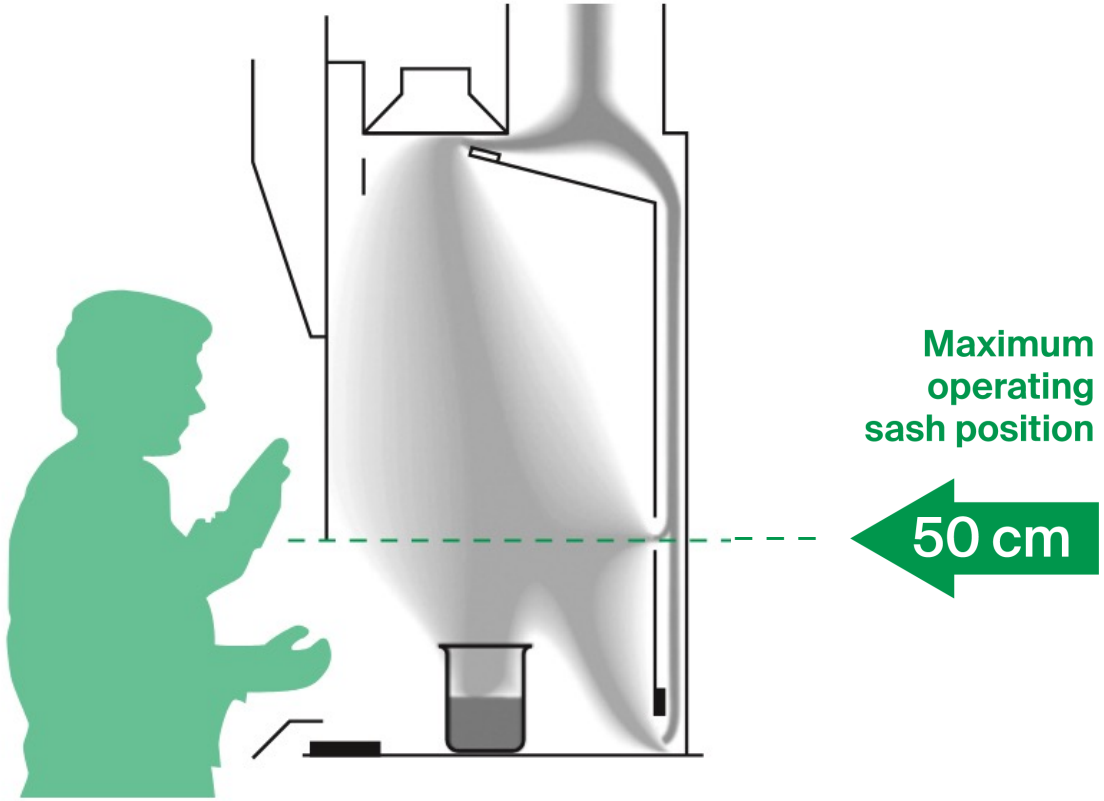
fume hood (chapelle)

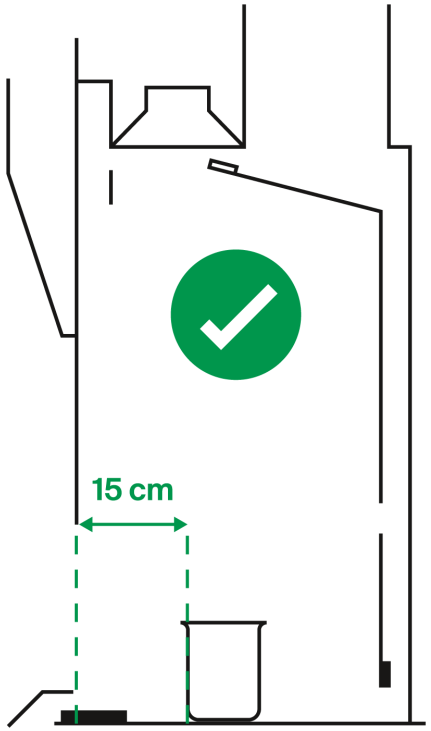
bench (paillasse)

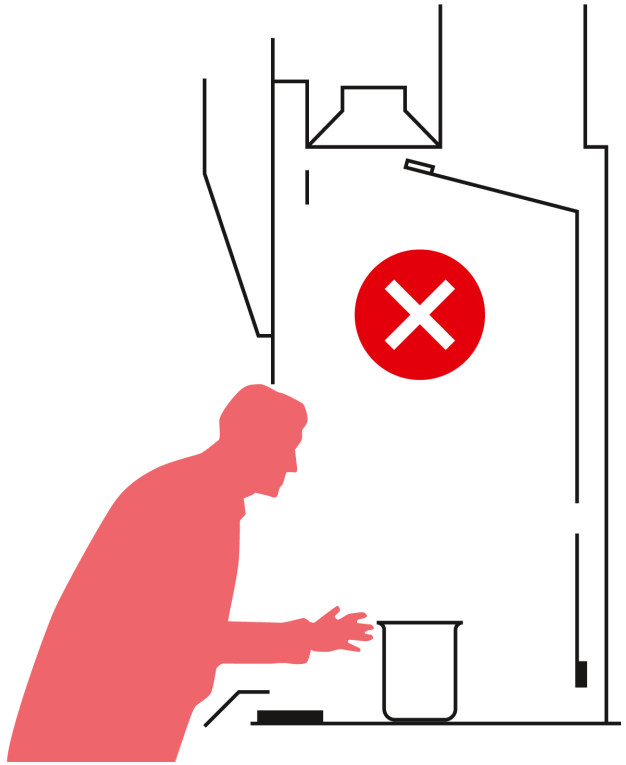
The Fume Hood



The Hood







Waste disposal (solid)

glass
(broken, dirty or clean)

normal

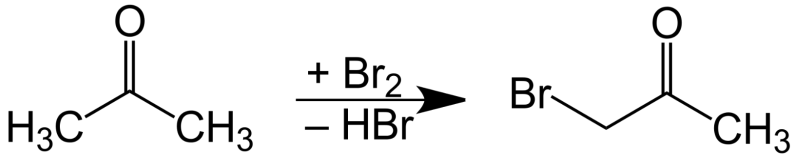
contaminated

At EPFL, there is 0 (zero) tolerance to eliminate special waste (chemical, biological, nano or radiactive) in the sink!
Waste is collected, separated according to its nature and in different categories, conditioned and disposed of.

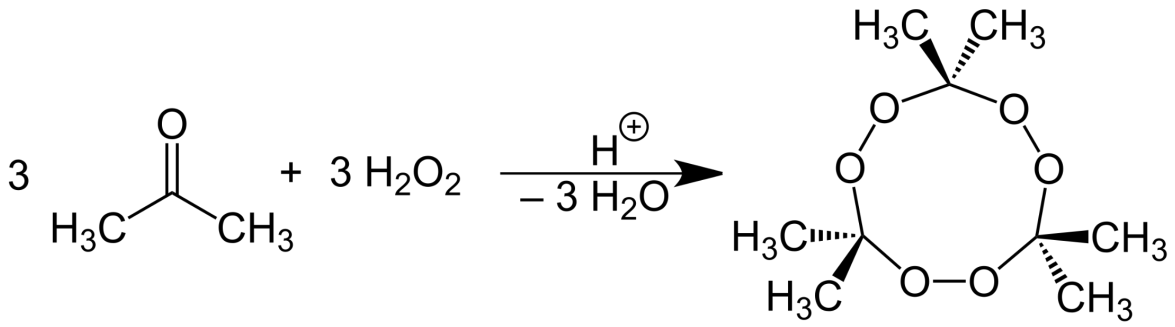
Waste (liquid)

solutions

be careful when combining solvent and chemcials:



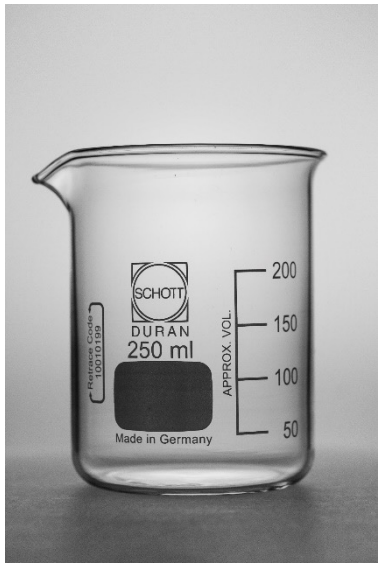
tear gas (lacrimogenic)

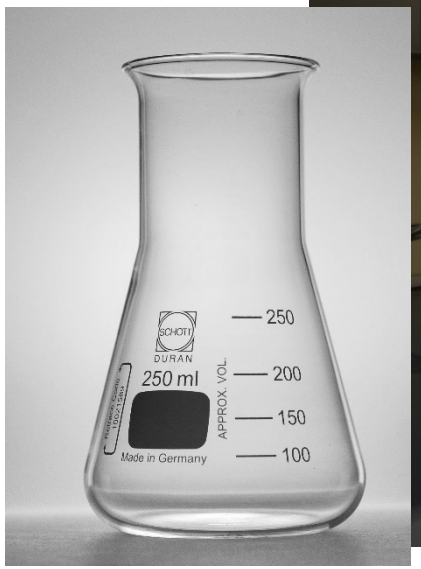


explosive

Cleaning

- working places
- public areas
- glass ware





Cleaning

- working places
- public areas

- distilled water
- Ethanol

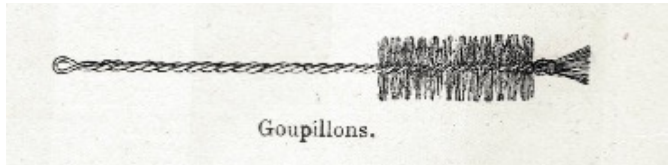
- plus towel paper

Cleaning

Glassware **contaminated with organic compounds**

interieur and exterieur:

- Acetone, min. 3×
- or water for water-soluble compounds
- if necessary, "mechanical" cleaning using a brush
- dishwasher



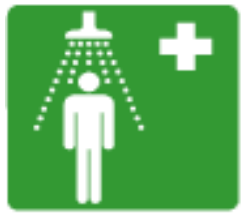
General Information for Working in a Lab

- Never enter a lab when you are not allowed to work there!
- Wear **lab coat** and **safety glasses**.
- **Use gloves** and frequently change them when dealing with chemical compounds.
- **Never eat or drink** in the laboratories!
- **Communicate** with your colleagues to exchange information (is there a suspicious smell? Ventilation break down?)
- **Close windows and lab doors** to ensure adequate ventilation!
- Work under a **fume hood** with chemicals with GHS pictograms. All procedures that can release dust, gas or vapours must be carried out in a fume hood
- Close the **fume hood sash**!
- Work benches must **be kept tidy and clean** (not a storage area)
- Emergency exits must have **free access**.
- Ensure **proper waste disposal**!
- **Switch off** all instruments, air condition, light, gas supplies, when not in use to save energy!

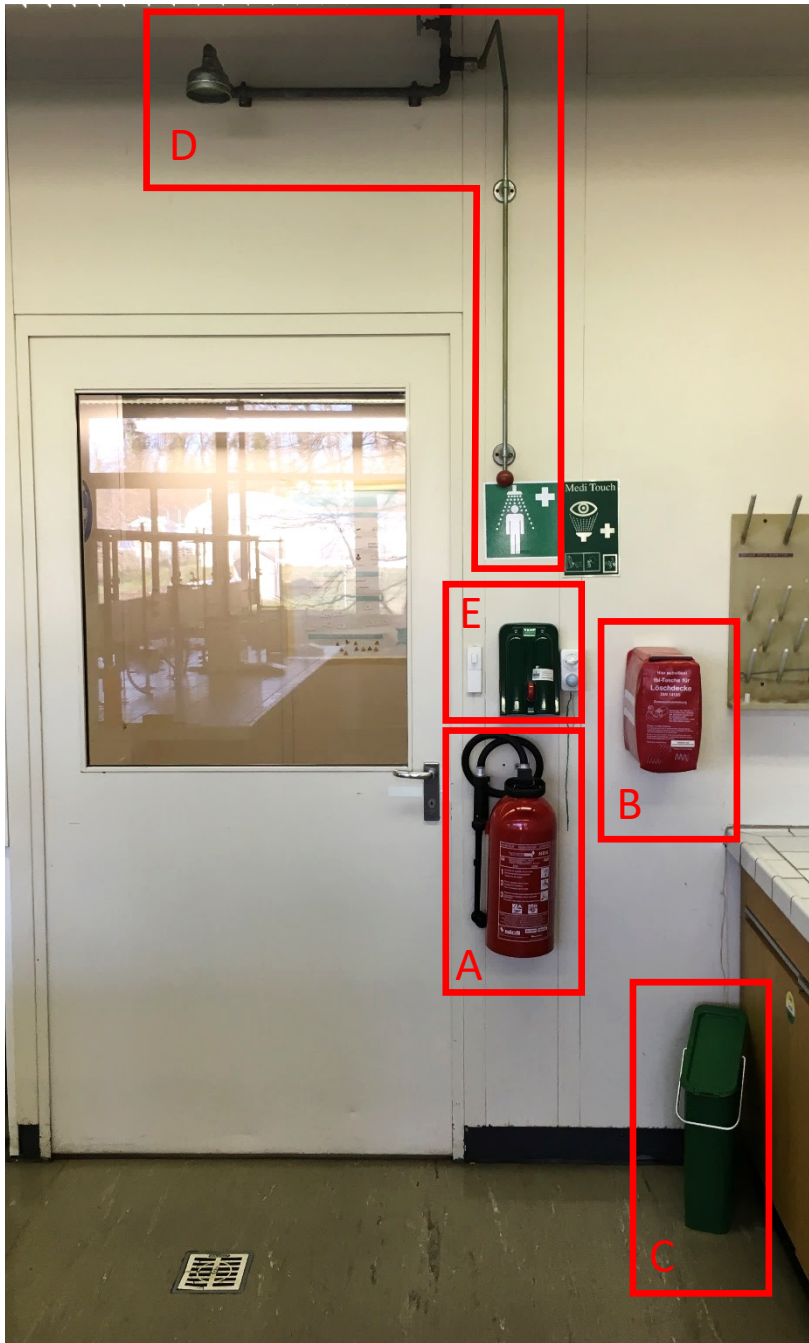
In case of emergency: don’t panic, inform your TAs, wash the skin if it is affected!

First Aid Equipment

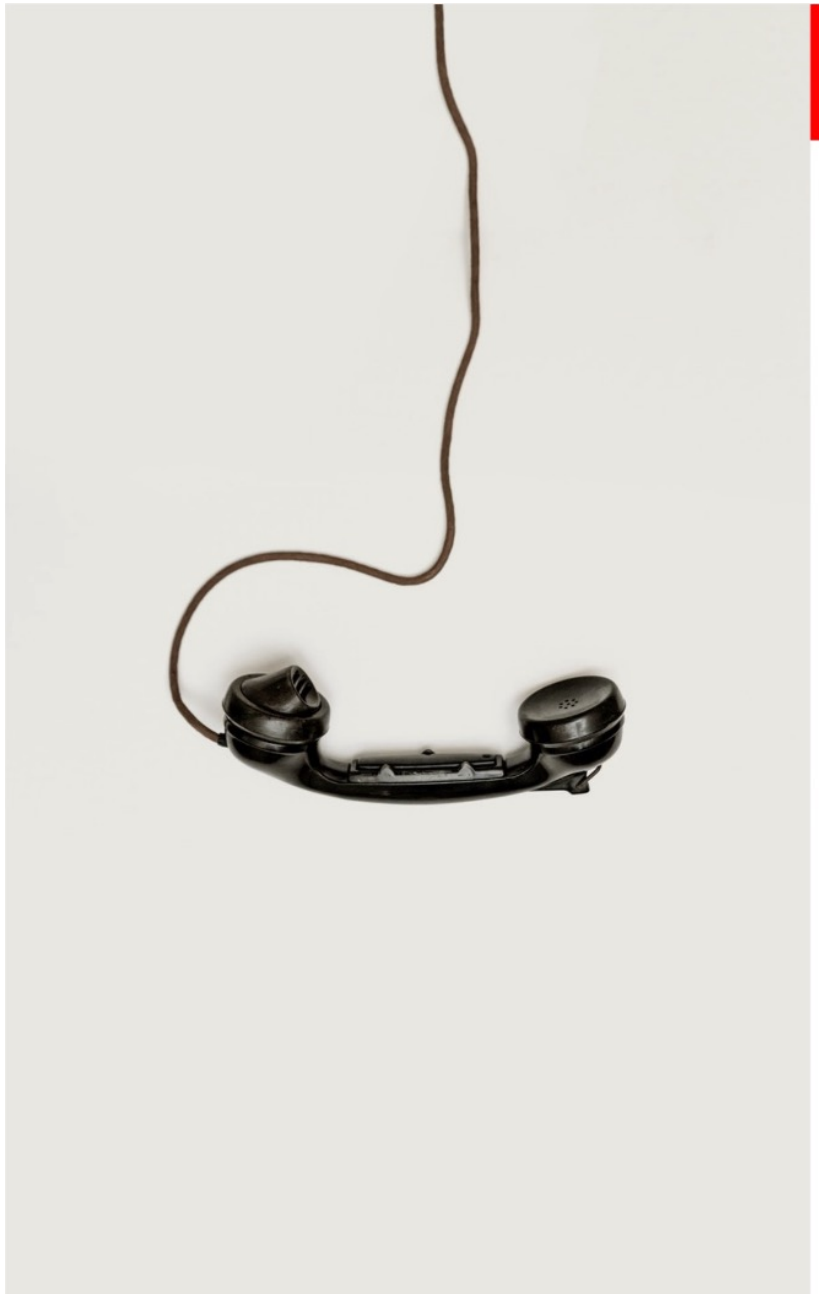
- **115** (021 693 30 00)
- Extinguisher (A)
- Fire blanket (B)
- Sandbox (C)
- Emergency shower (D)
- Eyewash (E)
- Adsorbent


D


E



Inform your TAs!



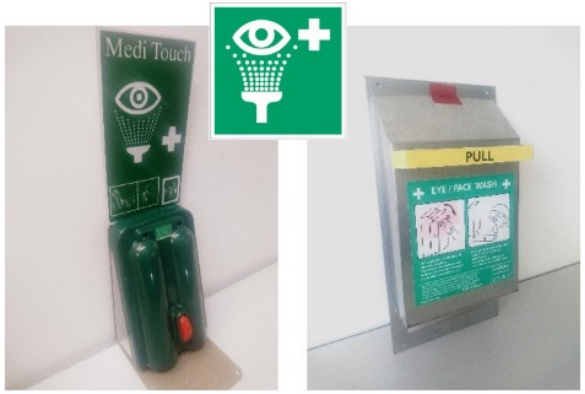
How to take care of burns

Two types of burns can be treated in the same manner

- Thermal burns (cold and hot)
- Chemical burns (acids, bases…)

The severness depends on the depth, the surface and the emplacement of the burn ! Never underestimate !

Wash with plenty of water for about 20 minutes.



Procedure in case of fire or explosion:

Raise the alarm

+41 21 693 30 00

115 (fixed line)

SOS (EPFL Campus app)

Fire pushbutton

Leave the area

Close the doors and windows

Assist with evacuation

Follow the signs for the escape routes

Fight fire

Use the available extinguishing means

Act without putting yourself at risk

Guide and inform

Inform the rescue services (people to be rescued, hazardous materials)

Evacuation Procedure

- When you hear the alarm, leave the building without delay (take your personal belongings)
- Follow the evacuation indications
- Do not go back
- Join the assembly point

Behave correctly

Suspicious odours

- Call the emergency number 115 from a landline, or with your mobile phone (021 693 3000) or use the Campus EPFL App.

Gas alarm

- Evacuate the lab and call the emergency number.
- At the second threshold level an alarm is sent to the emergency intervention team. Call the emergency number to give detailed information.

for all emergencies

24/24
free of charge

Call 115 landline

Call 021 693 3000 with a mobile phone

SOS Campus EPFL application

Implications for the Organic Chemistry Lab Course

Lab Course - Safety and organisation

La sécurité au laboratoire

Livret et charte de sécurité

- Règles de Sécurité
- Charte de sécurité

read!

sign!

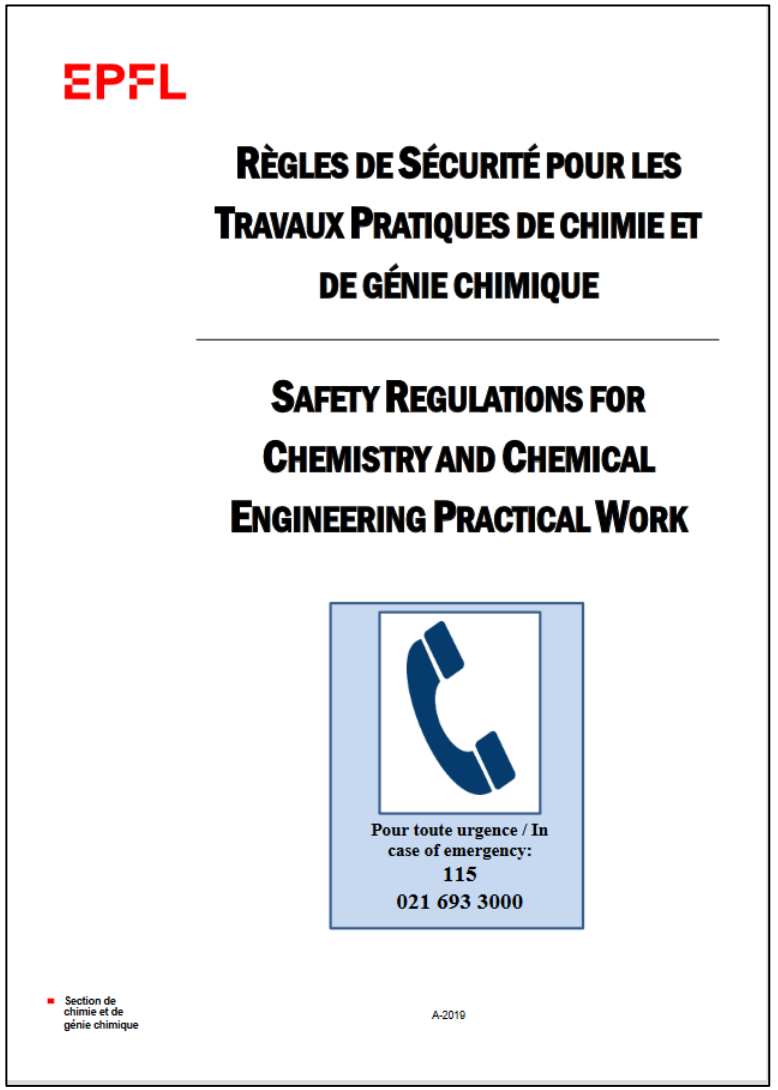
Sécurité au laboratoire

- Slides_Safety Introduction
- Test sur les règles de sécurité au laboratoire
- Lien vers le site Santé et sécurité au Travail (SST) de l'EPFL
- Comment consulter une fiche de sécurité

perform and pass! (open until Sunday)

Lab Course - Organisation and Protocols

- Practical Course Protocols/Reactions
- Practical Course Support
- Scientific writing



EPFL

RÈGLES DE SÉCURITÉ POUR LES TRAVAUX PRATIQUES DE CHIMIE ET DE GÉNIE CHIMIQUE

SAFETY REGULATIONS FOR CHEMISTRY AND CHEMICAL ENGINEERING PRACTICAL WORK

Pour toute urgence / In case of emergency:
115
021 693 3000

Section de chimie et de génie chimique

A-2019

Protocol Pre-Writing

fill out the first two pages before the lab course!

Organic Chemistry for Materials Scientists (MSE 211)

\- Lab Course -

Prof. Holger Frauenrath
EPFL – STI – IMX – LMOM, Station 12
1015 Lausanne, Switzerland

Phone: + 41 21 693 7396
Fax: + 41 21 693 5270
E-mail : holger.frauenrath@epfl.ch

Date:
Assistants:
Name, surname:
Name, surname:
N°:

Signature(s):

Synthesis and Purification of _____

Reaction Equation + Mechanism (including electron arrows)

Name of the Reaction Mechanism:

Quantities and Safety

Compound Name	Molar Mass (g.mol-1)	Mass/Volume, (g, mL)	Hazardous Symbol	Phrases H/P (n°)

Phrases H:	Phrases P:

Safety Data Sheets

- FDS
- Anglais : SDS, MSDS
- Common suppliers of chemical compounds

SIGMA-ALDRICH

https://www.sigmaaldrich.com/switzerland-suisse.html

is now MERCK

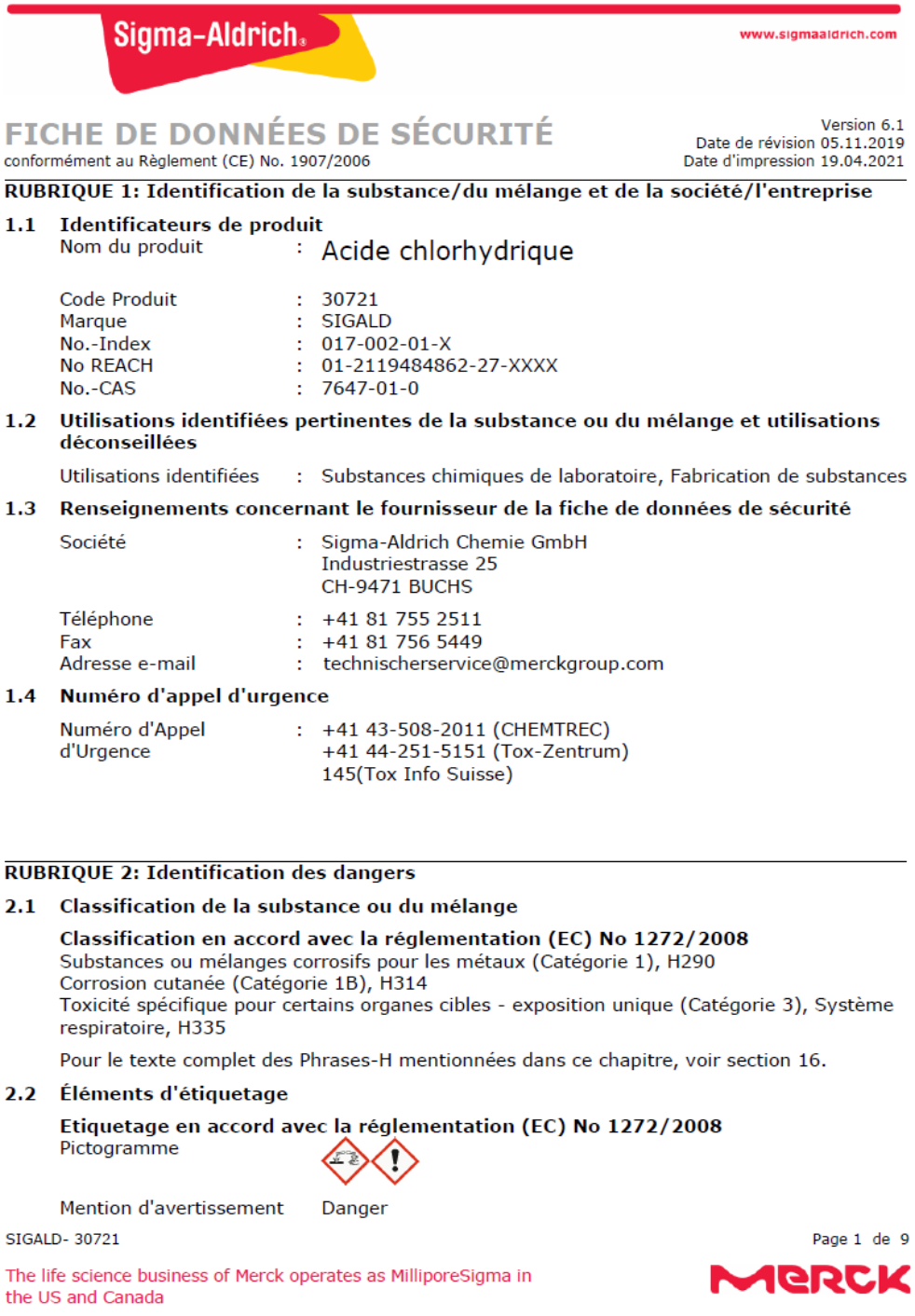
http://www.merckmillipore.com/CH/fr

DASITGROUP | CARLO ERBA REAGENTS

https://www.carloerbareagents.com/fr/

vwr part of avantor

https://fr.vwr.com/store/



Sigma-Aldrich. www.sigmaaldrich.com

FICHE DE DONNÉES DE SÉCURITÉ
conformément au Règlement (CE) No. 1907/2006

Version 6.1
Date de révision 05.11.2019
Date d'impression 19.04.2021

RUBRIQUE 1: Identification de la substance/du mélange et de la société/l'entreprise

1.1 Identificateurs de produit

Nom du produit : Acide chlorhydrique

Code Produit : 30721
Marque : SIGALD
No.-Index : 017-002-01-X
No REACH : 01-2119484862-27-XXXX
No.-CAS : 7647-01-0

1.2 Utilisations identifiées pertinentes de la substance ou du mélange et utilisations déconseillées

Utilisations identifiées : Substances chimiques de laboratoire, Fabrication de substances

1.3 Renseignements concernant le fournisseur de la fiche de données de sécurité

Société : Sigma-Aldrich Chemie GmbH
Industriestrasse 25
CH-9471 BUCHS

Téléphone : +41 81 755 2511
Fax : +41 81 756 5449
Adresse e-mail : technischerservice@merckgroup.com

1.4 Numéro d'appel d'urgence

Numéro d'Appel d'Urgence : +41 43-508-2011 (CHEMTREC)
+41 44-251-5151 (Tox-Zentrum)
145(Tox Info Suisse)

RUBRIQUE 2: Identification des dangers

2.1 Classification de la substance ou du mélange

Classification en accord avec la réglementation (EC) No 1272/2008
Substances ou mélanges corrosifs pour les métaux (Catégorie 1), H290
Corrosion cutanée (Catégorie 1B), H314
Toxicité spécifique pour certains organes cibles - exposition unique (Catégorie 3), Système respiratoire, H335

Pour le texte complet des Phrases-H mentionnées dans ce chapitre, voir section 16.

2.2 Éléments d'étiquetage

Etiquetage en accord avec la réglementation (EC) No 1272/2008
Pictogramme

Mention d'avertissement Danger

SIGALD- 30721 Page 1 de 9

The life science business of Merck operates as MilliporeSigma in the US and Canada

MERCK

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