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Hazards of substances

Module 2

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Background

- Much of earlier regulation listed below is still in affect regarding classification, labelling and packaging of chemicals (CLP). Latest regulations are 2023/707 and 2024/2865
- REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

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Background

- Latest safety regulation for chemicals in the EU focus on updating the Classification, Labelling and Packaging (CLP) Regulation (2023/707 & 2024/2865)
  - Most provisions become mandatory from 1st of July 2026, and the remaining provisions from the 1st of January 2027.
  - Label formatting in both digital and fold-out formats is revised in addition to hazard classes and criteria.
- This is extended with the “One Substance, One Assessment”, or OSOA framework (2025/2455) is implemented since 1st of January 2026
  - At the core, common data platform on chemicals which is accessible for everyone within EU law framework.

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Hazards: what do I need to know?

Recognize the different hazard pictograms

- Know which hazard pictogram describes a specific type of hazard
- Know examples of different chemicals that cause certain hazards, for example:
  - Organic solvents are flammable (which pictogram is this?)
  - Cr(VI)- ja Co-compounds cause cancer (which pictogram is this?)
  - Strong acids and bases are corrosive at high concentrations (which pictogram is this?)

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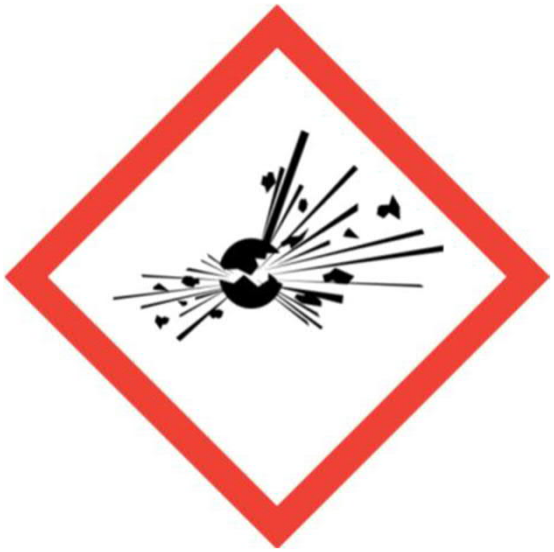
Hazards – pictograms (1/3)



GHS01
- Explosive
- Symbol: “Exploding bomb”

GHS02
- Flammable
- Symbol: “Flame”

GHS03
- Oxidising
- Symbol: “Flame over circle”

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Hazards – pictograms (2/3)

GHS04
- Gas under pressure
- Symbol: “Gas cylinder”

GHS05
- Corrosive
- Symbol: “Corrosion”

GHS06
- Acute toxicity
- Symbol: “Skull/crossbones”

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Hazards – pictograms (3/3)

GHS07
- Health hazard / Hazardous to the ozone layer
- Symbol: “Exclamation mark”

GHS08
- Serious health hazard
- Symbol:

“Health hazard (chronic)”

GHS09
- Hazardous to the environment
- Symbol:

“Environment/dead fish”

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Hazard statements (1/6)

Hazard statements	Precautionary statements
H200-H290 Physical hazards	P101-P103 General
H300-H373 Health hazards	P201-P285 Prevention
H400-H413 Environmental hazards	P301-P391 Response
ED – endocrine disruptors • For human health (Category 1-2) • For the environment (Category 1-2) These are related to EUH statements EUH380-451	P401-P422 Storage
https://www.msds-europe.com/h-statements/	P501 Handling of waste/disposal

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Hazard statements (2/6)

- The introduction of new classes is a scientific paradigm shift that is realised with identifying endocrine disruptor (ED) properties.
- Environmental risks are evaluated with persistence, bioaccumulation and toxicity (PBT/vPvB) and persistence, mobility and toxicity (PMT/vPvM) classes.
  - E.g. heavy metals, lead compounds, nitrates and some organic solvents.
- In the next slide you can see the summary of the new classes and their associated codes.

Hazard class name	Category	Abbreviation	Related EUH statement
Endocrine disruptor (human health)	Category 1	ED HH 1	EUH380
Endocrine disruptor (human health)	Category 2	ED HH 2	EUH381
Endocrine disruptor (environment)	Category 1	ED ENV 1	EUH430
Endocrine disruptor (environment)	Category 2	ED ENV 2	EUH431
Persistent, bioaccumulative and toxic	–	PBT	EUH440
Very persistent and very bioaccumulative	–	vPvB	EUH441
Persistent, mobile and toxic	–	PMT	EUH450
Very persistent and very mobile	–	vPvM	EUH451

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Hazard statements (4/6)

- Some examples and the inverse-scale rule: *the smaller the number, the worse the effect*
- Acute toxicity 1, 2
  - H300: Fatal if swallowed
  - H310: Fatal in contact with skin.
  - H330: Fatal if inhaled.
- Acute toxicity 3
  - H301: Toxic if swallowed.
  - H311: Toxic in contact with skin.
  - H331: Toxic if inhaled.

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Hazard statements (5/6)

- Some examples and rule:
  the smaller the number, the worse the effect
- Acute toxicity 4
  - H302: Harmful if swallowed
  - H312: Harmful in contact with skin.
  - H332: Harmful if inhaled.
- Carcinogenicity (Carc. 1A/1B)
  - H350: May cause cancer.
  - H350i: May cause cancer by inhalation.
- Germ cell mutagenicity (Muta. 1A/1B)
  - H340: May cause genetic defects.

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Hazard statements (6/6)

- Flammable liquid (Flam. Liq. 1)
  - H224: Extremely flammable liquid and vapour.
- Flammable liquid (Flam. Liq. 2)
  - H225: Highly flammable liquid and vapour.
- Flammable liquid (Flam. Liq. 3)
  - H226: Flammable liquid and vapour.

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Precautionary statements (1/2)

- Intended to form standardised phrases for the correct handling of chemical substances and mixtures.
- Some examples
- Prevention
  - P264: Wash…thoroughly after handling (e.g. hands).
  - P270: Do not eat, drink, or smoke when using this product.
- Storage
  - P405: Store locked up.
- Handling waste
  - P501: Dispose of contents/container to …(e.g. according to the local decree)

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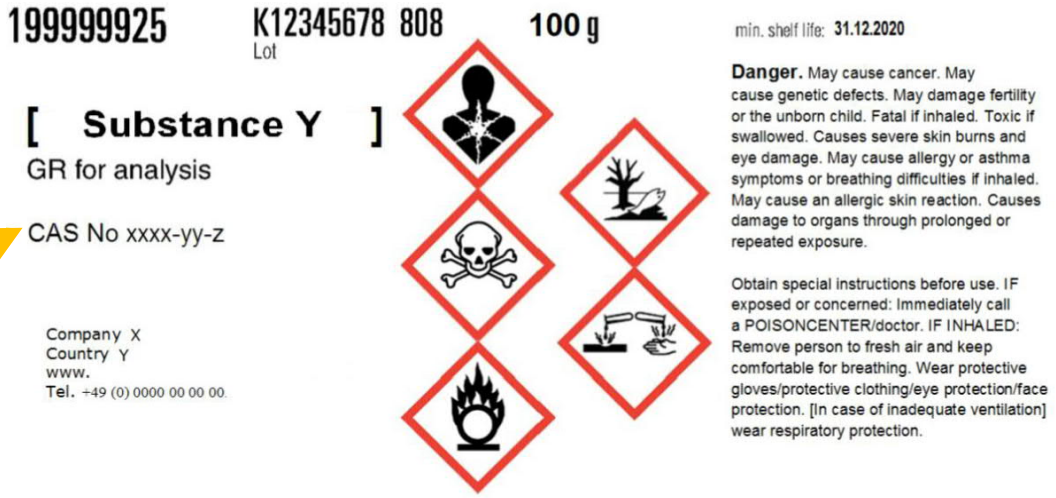
Precautionary statements (2/2)

- Response measures
  - P301+PP310: Immediately call a POISON CENTER/doctor.
  - P321: Specific treatment (see … on this label).
  - P330: Rinse mouth.

Example label for a substance



CAS number = “social security number for chemicals”

Guidance on labelling and packaging in accordance with Regulation (EC) No 1272/2008 (3/2019 Ver. 4.0)

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Safety data sheet (SDS)

- They are the central instructions of laboratory safety.
- Safety data sheets (SDS) are intended to provide the users of chemicals with the necessary information to help them protect human health and the environment.
- The format of the safety data sheet is defined in the REACH Regulation. It is divided into 16 sections.
- A safety data sheet should be provided when a substance or a mixture is classified as hazardous.
    - Look for them on the chemical suppliers' web pages (usually the best way is to use CAS number).

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Safety data sheet (SDS)

Section 1: Identification of the substance/mixture and of the company/undertaking.	Section 9: Physical and chemical properties.
Section 2: Hazard identification	Section 10: Stability and reactivity.
Section 3: Composition/information on ingredients	Section 11: Toxicological information.
Section 4: First aid measures.	Section 12: Ecological information.
Section 5: Firefighting measures.	Section 13: Disposal considerations.
Section 6: Accidental release measures	Section 14: Transport information.
Section 7: Handling and storage	Section 15: Regulatory information.
Section 8: Exposure controls/personal protection.	Section 16: Other information.
You can find detailed information about compiling a sds for a substance here: https://echa.europa.eu/-/guidance-on-the-compilation-of-safety-data-sheets	

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Health hazards

Chemical hazards

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Health hazard classes and categories (1/2)

Health hazards: 10 classes

- Each class includes one or more hazard categories.
- The smaller the category number, the bigger the danger.
- Mnemonic: Category 1A (”we know”), Category 1B (”we presume”), Category 2 (”we suspect”).

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Health hazard classes and categories (2/2)

Classes:

- Acute toxicity
- Skin corrosion / irritation
- Eye damage / irritation
- Respiratory / skin sensitisation
- Mutagenicity
- Carcinogenicity
- Toxic for reproduction
- Specific target organ toxicity (single exposure)
- Specific target organ toxicity (repeated exposure)
- Aspiration hazard

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Health hazard classes and categories: acute toxicity (1/5)

- Acute toxicity means those adverse effects occurring following oral, dermal or inhalation exposure.
- The lowest lethal dose (LD_{Lo}) is the smallest amount that can cause death.
- The lethal dose LD_{50} and lethal concentration LC_{50} are the dose/concentration required to kill half of the members of the tested population.
  - The acute toxicity estimates are derived using the LD_{50}/LC_{50} values where available.

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Health hazard classes and categories: acute toxicity (2/5)

Exposure route	Category 1	Category 2	Category 3	Category 4
Oral (mg/kg)	< 5	5-50	50-300	300-2000
Dermal (mg/kg)	<50	50-200	200-1000	1000-2000
Gases (ppmV)	<100	100-500	500-2500	2500-20000
Vapours (mg/l)	<0,5	0,5-2	2-10	10-20
Dusts and mists (mg/l)	<0,05	0,05-0,5	0,5-1	1-5

Exposure by inhalation

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Health hazard classes and categories: acute toxicity (3/5)

- A chemical respiratory poison paralyses breathing by either preventing oxygen from being carried to the different parts of the body, or by affecting the part of the central nervous system which regulates breathing.
  - For example: HCN (1), HF (1), Br_2 (1) H_2S (2), acetic anhydride (2), p-benzoquinone (3), CO (3).
- Some poisons absorb through the skin.
  - For example: cyanides (1), fluorides (1), p-anisidine (1), phenol (3), methanol (3).
- Some poisons affect many parts of the human body simultaneously.
  - For example: Hg (1), As (2), phenol (3), Pb (4).

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Health hazard classes and categories: acute toxicity (4/5)

- Gas which displaces the oxygen in air
  - Gases that displace O_2 are not poisonous as such but may dilute the oxygen concentration of air. The first symptoms of hypoxia begin when the oxygen concentration decreases from 21% to 16%.
- There are not many examples of such gases because nearly all gases have toxic effects in already much smaller concentrations than are required to reach O_2 deficiency.
  - Inert gases can displace O_2: N_2, H_2, CO_2 and noble gases

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Health hazard classes and categories: acute toxicity (5/5)

- Toxic symptoms: sickness, vomit, stomach burnings, diarrhea, pain, changes in the consciousness, fatigue, restlessness, visual disturbance, breathing difficulties, circulatory disorders, shock, convulsion, unconsciousness, the stop of breathing and heart attack
- All students should be covered with accident insurance in the institution (must be arranged).
    - The dose makes the poison!

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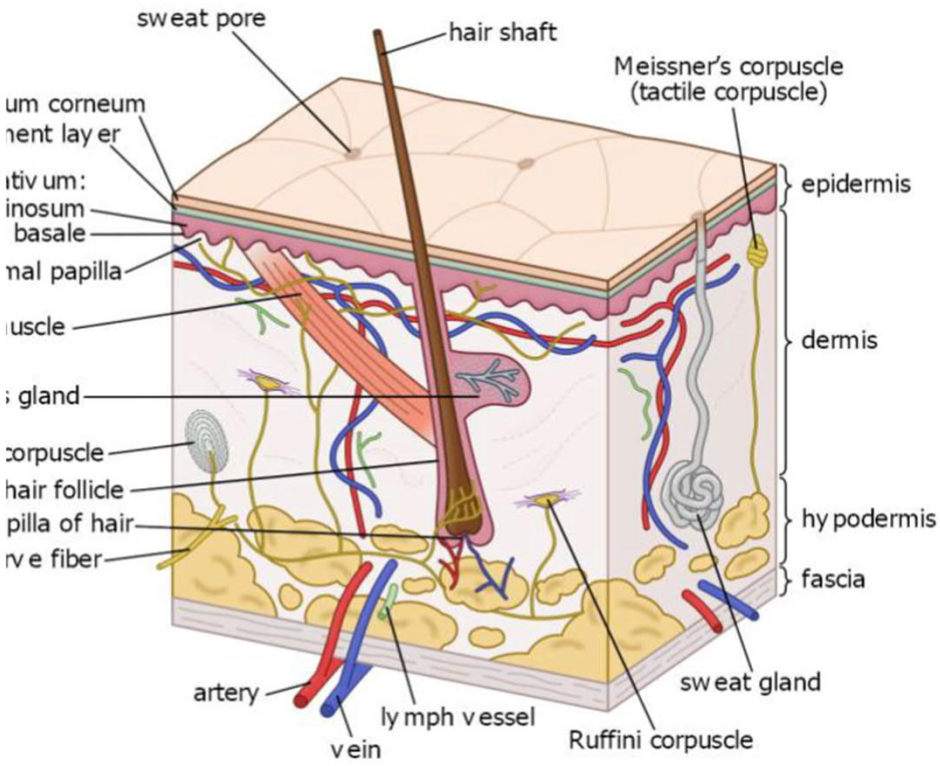
Health hazard classes and categories: skin corrosion/irritation (1/3)

- Skin corrosion means the production of irreversible damage to the skin, i.e. visible necrosis through the epidermis and into the dermis.
- Corrosive reactions are typified by ulcers, bleeding, bloody scabs and discoloration due to the blanching of the skin, complete areas of alopecia, and scars.
- Skin Corr.
  - 1A (≤ 3 min exposure, ≤ 1 h observation)
  - 1B (≤ 1 h exposure, ≤ 14 d observation)
  - 1C (≤ 4 h exposure, ≤ 14 d observation).



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Health hazard classes and categories: skin corrosion/irritation (2/3)

- Skin irritation means the production of reversible damage to the skin. Reversibility of skin lesions is also considered in evaluating irritant responses.
  - When inflammation persists to the end of the observation period, taking into consideration alopecia (limited area), hyperkeratosis, hyperplasia, and scaling, then a material shall be considered an irritant. (OECD Test Guideline 404/405)
  - Grouping is mainly under: Skin irritation (H315), Serious eye irritation (H319), Respiratory irritation (STOT SE 3, H335)
- Skin Irrit. 2 (≤ 4 h exposure, ≤ 14 d observation).
  - Notice that many corrosive substances are irritating when they are diluted!

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Health hazard classes and categories: skin corrosion/irritation (3/3)

- Notice that Skin Corr./Irrit. substances affect the eyes, respiratory organs, and digestive organs correspondingly, but more drastically!
  - For eyes, bases are the most dangerous!
  - Respiratory system effects include coughing, shortness of breath, pulmonary edema, pneumonia, and bronchitis
  - Digestive system effects also include tooth damage
- All strong acids and bases are corrosive when their concentration is high enough.
- Irritating substances include, for example: chlorine gas, solvents, lubricants and resins.

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Health hazard classes and categories: serious eye damage / eye irritation

- Serious eye damage means the production of tissue damage in the eye, or serious physical decay of vision: Eye Dam. 1.
  - For example, 1-propanol, acetic anhydride, Br2

- Eye irritation means the production of changes in the eye (sting, redness, swelling, sensitivity to light etc.), which are fully reversible within 21 days of observation. Eye Irrit. 2.

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Health hazard classes and categories: respiratory/skin sensitisation (1/2)

- Respiratory sensitiser means a substance that will lead to hypersensitivity of the airways following inhalation of the substance.
- Skin sensitiser means a substance that will lead to an allergic response following skin contact.
- Sensitisation includes two phases: the first phase is the induction of specialised immunological memory in an individual by exposure to an allergen. The second phase is elicitation, i.e., the production of a cell-mediated or antibody-mediated allergic response by exposing a sensitised individual to an allergen.

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Health hazard classes and categories: respiratory/skin sensitisation (2/2)

Resp. Sens. 1, 1A, 1B.

- Hypersensitivity is normally seen as asthma, but other hypersensitivity reactions such as rhinitis/conjunctivitis and alveolitis can also appear.

Skin Sens. 1, 1A, 1B.

- For example: allergic contact dermatitis/ eczema
- For example: Ni, Co, chromates, turpentine, formaldehyde, hydroquinone

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Health hazard classes and categories: germ cell mutagenicity

- This hazard class is primarily concerned with substances that may cause mutations in the germ cells of humans that can be transmitted to the progeny (children).
- Muta. 1A.
  - No examples yet
- Muta. 1B.
  - For example Cd, Cr(VI), benzene
- Muta. 2.
  - For example Co, Ni, Hg, phenol, hydroquinone, phenolphthalein

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Health hazard classes and categories: reproductive toxicity

- Reproductive toxicity includes adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring (children).
- Any effect of substances that has the potential to interfere with sexual function and fertility.
- Developmental toxicity includes, in its widest sense, any effect which interferes with normal development of the offspring.
- Therefore, for pragmatic purposes of classification, developmental toxicity essentially means adverse effects induced during pregnancy, or as a result of parental exposure. These effects can be manifested at any point in the life span of the organism.
- The major manifestations of developmental toxicity include (1) death of the developing offspring, (2) structural abnormality, (3) altered growth, and (4) functional deficiency.

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Health hazard classes and categories: reproductive toxicity

- Repr. 1A.
  - For example Co and Pb.
- Repr. 1B.
  - For example B, benzaldehyde, Co, Ni, Cd, and Cr(VI).
- Repr. 2.
  - For example Hg and phenolphthalein.
- Lact.
  - Adverse effects on or via lactation are also included in reproductive toxicity.

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Health hazard classes and categories: carcinogenicity

- Carcinogen means a substance or a mixture of substances that induces cancer or increases its incidence.
- Skin cancer is caused, for example, by tar, bitumen and As (Carc. 1A).
- Cancer of respiratory organs can be caused, for example, asbestos (Carc. 1A), As (Carc. 1A), Ni (Carc. 1A), Cr(VI) (Carc. 1A), Cd (Carc. 1B) and Co (Carc. 1B).
- Many others:
  - In urinary tracts: many aromatic amines, like p-anisidine (Carc. 1A-2). In bones, benzene (Carc. 1A), Phenolphthalein (Carc. 1B), thioacetamide (Carc. 1B), bromates (Carc. 2), thiourea (Carc. 2), and chloromethanes (Carc. 2) may also cause cancer.

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Health hazard classes and categories: specific target organ toxicity – single exposure (1/2)

- Specific target organ toxicity single exposure or STOS SE, is defined as specific, non-lethal target organ toxicity arising from a single exposure to a substance or a mixture. All significant health effects that can impair function, both reversible and irreversible, immediate and/or delayed, are included.
- STOT SE 1. Significant and/or severe toxic effects of relevance to human health were produced at generally low exposure concentrations.
- STOT SE 2. Significant toxic effects, of relevance to human health, were produced at generally moderate exposure concentrations.
- STOT SE 3. Significant narcotic effects and respiratory tract irritation.
  - Criteria: central nervous system depression in humans, such as drowsiness, narcosis, reduced alertness, loss of reflexes, lack of coordination, and vertigo. Sometimes, severe headache, nausea, and cognitive dysfunction are noticeable.

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Health hazard classes and categories: specific target organ toxicity – single exposure (2/2)

- Most likely the dissolution of fat is the reason for the narcotic effect, which is exacerbated by the permeable blood-brain barrier and composition of fatty nerve tissue.
  - For example: organic solvents, such as aliphatic and aromatic hydrocarbons, alcohols, ethers, esters and ketones.
- Methanol (Acute Tox. 3, STOT SE 1) affects the central nervous system but especially the ophthalmic nerve (blindness).
  - Not methanol specifically, but its metabolic product formic acid.

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Health hazard classes and categories: specific target organ toxicity – repeated exposure (1/2)

- Target organ toxicity - repeated exposure or STOT RE, means specific, target organ toxicity arising from repeated exposure to a substance or mixture. All significant health effects that can impair function, both reversible and irreversible, immediate and/or delayed, are included.
- STOT RE 1. Toxic effects are produced at low exposure concentrations.
  - For example: Hg (central nervous system), Cd (especially liver and kidneys), benzene (bone marrow), carbon tetrachloride (especially liver).
- STOT RE 2. Toxic effects are produced at moderate exposure concentratio
  - For example, chloroform and Mn (central nervous system).

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Health hazard classes and categories: specific target organ toxicity – repeated exposure (2/2)

- All dust can cause transient lung symptoms, especially when inhaled in large concentrations
- Substances that cause pneumoconiosis can lead to the formation of scar tissue in the lungs.
  - For example, fiber-like silicate minerals (asbestos, STOT RE 1) in the lungs result in diffuse pulmonary fibrosis i.e., asbestosis.
- Pneumoconiosis typically develops only in heavy industrial environments with long-term exposure to high levels of harmful dusts. School laboratories and chemical storage areas do not normally present this risk, but repeated exposure to airborne fine powders can still cause irritation or trigger asthma. Good practice is to maintain consistent year-round ventilation to keep dust levels low and minimise respiratory discomfort.

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Health hazard classes and categories: aspiration hazard

- Aspiration means the entry of a liquid or solid directly through the oral or nasal cavity, or indirectly from vomiting, into the trachea and lower respiratory system.
- Aspiration toxicity includes severe acute effects such as chemical pneumonia, varying degrees of pulmonary injury or death following aspiration.
- Asp. Tox. 1. Substances include but are not limited to certain hydrocarbons, turpentine and pine oil.

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Test your knowledge (1/3)

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Test your knowledge (2/3)

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Physical hazards

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Physical hazard classes and categories

Physical hazards: 16 classes

- Each class includes one or more hazard categories.
- The smaller the category number the bigger the danger.

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Physical hazard classes and categories

Classes	
Explosives	Pyrophoric liquids
Flammable gases	Pyrophoric solids
Flammable aerosols and aerosols	Self-heating substance/mixture
Oxidising gases	Water-reactive - emits flammable gases
Gases under pressure	Oxidising liquids
Flammable liquids	Oxidising solids
Flammable solids	Organic peroxides
Self-reactive substance/mixture	Corrosive to metals
https://www.echa.europa.eu/support/mixture-classification/hazard-class-table	

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Physical hazard classes and categories: explosives

- An explosive substance or mixture is a solid or liquid substance or mixture of substances which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings.
  - Pyrotechnic substances are included even when they do not evolve gases.
- An unstable explosive is an explosive substance or mixture which is thermally unstable and/or too sensitive for normal handling, transport and use.
- Unst. Expl. and Expl. 1.1-1.6 (TNT is Expl. 1.1).

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Physical hazard classes and categories: organic peroxides

- Organic peroxides are liquid or solid organic substances that contain the bivalent -O-O-bond.
- They are thermally unstable substances or mixtures that can undergo exothermic self-accelerating decomposition.
  - Can form, for example, in ethers, 2-propanol, ethylene glycol etc., as a result of light
- In addition, they can have one or more of the following properties:
  - be liable to explosive decomposition
  - burn rapidly
  - be sensitive to impact or friction
  - react dangerously with other substances
- Org. Perox. A-G.

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Physical hazard classes and categories: self-reactive substances and mixtures

- Self-reactive substances or mixtures are thermally unstable liquid or solid substances or mixtures liable to undergo a strongly exothermic decomposition even without participation of oxygen.
- Self-react. A-G.
  - Category A; H240: Heating may cause an explosion.
  - Organic nitrates, monomers, high-nitrogen compounds

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Physical hazard classes and categories: pyrophoric liquids and solids

- Pyrophoric liquid/solid means a liquid/solid substance or mixture which, even in small quantities, is liable to ignite within five minutes after coming into contact with air.
- Pyr. Liq. 1, Pyr. Sol. 1.
  - For example, reactive organometallic compounds such as AlMe3 (TMA) and ZnMe2 (DMZ).

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Physical hazard classes and categories: self-heating substances and mixtures

- A self-heating substance or mixture is a liquid or solid substance or mixture, other than a pyrophoric liquid or solid, which, by reaction with air and without energy supply, is liable to self-heat
  - This substance or mixture differs from a pyrophoric liquid or solid in that it will ignite only when in large amounts (kilograms) and after long periods of time (hours or days).
- Self-heat. 1, 2.
  - All metal alkoxides

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Physical hazard classes and categories: Substances and mixtures which, in contact with water, emit flammable gases

- Water-react. 1, 2, 3.
  - For example, alkaline- and alkaline-earth metals, organometallic compounds, hydrides.

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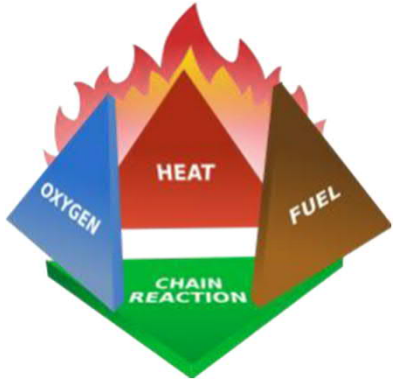
Physical hazard classes and categories: flammable gases, aerosols, liquids and solids

- Substances which can catch fire easily.
  - Nearly all organic substances and materials, except polyhalogenated, are flammable: acetylene, liquefied petroleum gas, solvents, oils, papers, textiles etc.
  - Fuel, oxygen and an ignition source are needed for the burning.
- Ignition sources: a burning match, cigarette, Bunsen burner, hotplate, oil baths, spark from a broken electrical apparatus, or from static electricity.
- Flam. Gas 1, 2, Flam. Aerosol 1, 2, 3, Flam. Liq. 1, 2, 3, Flam. Sol. 1, 2.



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Physical hazard classes and categories: oxidising gases, liquids and solids

- Oxidising gas/liquid/solid means any gas/liquid/solid or mixture which may cause or contribute to the combustion of other materials.
  - For example, oxygen, hydrogen peroxide, nitric acid, perchloric acid, nitrates, chlorates, perchlorates, bromates, permanganates, chromates, dichromates.
- Ox. Gas 1, Ox. Liq. 1, 2, 3, Ox. Sol. 1, 2, 3.

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Physical hazard classes and categories: gases under pressure (1/2)

- Gases under pressure are gases which are contained in a gas cylinder usually at a pressure of 200 bar at 20 °C, or which are liquefied, or liquefied and refrigerated.
  - Pressurized gases: O_2, N_2, H_2, noble gases
  - Liquefied gases: H_2S, NH_3, CO_2
    - Bottle contents mostly liquid, the pressure is the vapor pressure of the compound
- Press. Gas Comp. (Compressed gas), Press. Gas Liq. (Liquefied gas), Press. Gas Ref. Liq. (Refrigerated liquefied gas), Press. Gas Diss. (Dissolved gas).

Physical hazard classes and categories: gases under pressure (2/2)

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- The biggest threat is the breaking down of the valve of the bottle, in which case the gas in the cylinder expands fast to air pressure (and any liquid vaporises). The gas will expand to occupy several hundred times the space.
  - This can displace air in a room and result in an oxygen-deficient atmosphere.
  - The bottle can fly through several walls and several hundred meters.
- A rise in temperature, for example, in a fire, can also break the valve or the cylinder, and can cause an explosion.
  - In the case of flammable gas, the danger is especially grave.

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Physical hazard classes and categories: Corrosive to metals

- Substance or a mixture which by chemical action will materially damage, or even destroy, metals.
- Met. Corr. 1.
  - For example, many chlorides and acids.

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Environmental hazards

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Environmental hazard classes and categories

- Environmental hazards: 2 classes.
  - Hazardous to the aquatic environment
  - Hazardous to the ozone layer
- The smaller the category number, the bigger the danger.

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Environmental hazard classes and categories: hazardous to the aquatic environment (1/2)

- Acute Category.
  - The criteria for classification of a substance in Acute category are defined on the basis of acute aquatic toxicity (e.g., LC_{50} for fish or ErC_{50} for algae).
  - ErC_{50} is the concentration of the test substance, which results in a 50 percent reduction in growth rate.
- Aquatic Acute 1.
  - For example, Br_2 and $LiAlH_4$, are reducing agents in organic synthesis.

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Environmental hazard classes and categories: hazardous to the aquatic environment (2/2)

Chronic Category.

- Aquatic Chronic 1-3.
  - It is often based on the no-observed-effect-concentration (NOEC) value, which means the highest test concentration (mg/l) at which no toxic effects are observed.
- Aquatic Chronic 1.
  - For example, hydroquinone, potassium permanganate.
- Aquatic Chronic 4.
  - Cases when data do not allow classification under the above criteria, but there are nevertheless some grounds for concern.
  - For example, sulphur compounds.

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Environmental hazard classes and categories: hazardous to the ozone layer

- A substance shall be classified as hazardous to the ozone layer (Category 1) if the available evidence concerning its properties and its predicted or observed environmental fate and behavior indicate that it may present a danger to the structure and/or the functioning of the stratospheric ozone layer.
- Ozone 1.
  - For example, CCl_4.

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Test your knowledge (3/3)

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Congratulations on completing module 2

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