

Chemical Profiles

Sodium Hydroxide

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What are other names or identifying information for sodium hydroxide?

CAS Registry No.: 1310-73-2

Other Names: Caustic soda, Lye

Main Uses: Manufacture of other chemicals, and used in many manufacturing processes.

Appearance: Colourless to white solid.

Odour: Odourless

Canadian TDG: UN1823, UN1824

What is the WHMIS classification?

According to the Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST), [sodium hydroxide](#) can be classified as:

Skin corrosion/irritation - Category 1



Serious eye damage/eye irritation - Category 1



The signal word is danger.

The hazard statement is:

- Causes severe skin burns and eye damage.

Comment from CNESST: This product could be corrosive to metals, please contact the supplier for additional information.

Please note that this classification was retrieved from the [CNESST](#) site on February 22, 2022 and was established by CNESST personnel to the best of their knowledge based on data obtained from scientific literature and it incorporates the criteria contained in the *Hazardous Products Regulations* (SOR/2015-17). It does not replace the supplier's classification which can be found on its Safety Data Sheet.

What are the most important things to know about sodium hydroxide in an emergency?

Emergency Overview: Colourless to white solid. Odourless. Will not burn. Highly Reactive. Incompatible with many common chemicals. Reacts violently with water. Contact with metals liberates flammable hydrogen gas. EXTREMELY CORROSIVE. Causes severe skin burns and eye damage.

What are the potential health effects of sodium hydroxide?

Main Routes of Exposure: Skin contact. Eye contact.

- **Inhalation:** Not expected to be an inhalation hazard unless it becomes an airborne dust or mist. Can cause severe irritation of the nose and throat.
 - **Skin Contact:** CORROSIVE. Contact can cause pain, redness, burns, and blistering. Permanent scarring can result. A severe exposure can cause death. Burns may not be immediately painful; onset of pain may be delayed minutes to hours.
 - **Eye Contact:** CORROSIVE. Contact causes severe burns with redness, swelling, pain and blurred vision. Permanent damage including blindness can result.
 - **Ingestion:** Can burn the lips, tongue, throat and stomach. Symptoms may include nausea, vomiting, stomach cramps and diarrhea. Can cause death.
 - **Effects of Long-Term (Chronic) Exposure:** Conclusions cannot be drawn from the limited studies available. Can cause dry, red, cracked skin (dermatitis) following skin contact.
 - **Carcinogenicity:** Not known to cause cancer.
 - International Agency for Research on Cancer (IARC): Not specifically designated.
 - American Conference for Governmental Industrial Hygienists (ACGIH): Not specifically designated.
 - **Teratogenicity / Embryotoxicity:** Not known to harm the unborn child.
 - **Reproductive Toxicity:** Not known to be a reproductive hazard.
 - **Mutagenicity:** Not known to be a mutagen.
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What are first aid measures for sodium hydroxide?

Inhalation: Move victim to fresh air. If breathing has stopped, trained personnel should begin artificial respiration (AR). Get medical attention as soon as possible.

Skin Contact: Avoid direct contact. Wear chemical protective clothing if necessary. Quickly take off contaminated clothing, shoes, and leather goods (e.g., watchbands, belts). Quickly and gently blot or brush away excess chemical. Immediately flush with gently flowing water for at least 60 minutes. DO NOT INTERRUPT FLUSHING. If it can be done safely, continue flushing during transport to hospital. Get medical attention promptly. Treatment is urgently required. Transport to a hospital. Thoroughly clean clothing, shoes and leather goods before reuse or dispose of safely.

Eye Contact: Avoid direct contact. Wear chemical protective gloves if necessary. Quickly and gently blot or brush chemical off the face. Immediately flush the contaminated eye(s) with gently flowing water for at least 60 minutes, occasionally lifting the upper and lower eyelids. If a contact lens is present, DO NOT delay flushing or attempt to remove the lens. Take care not to rinse contaminated water into the unaffected eye or onto the face. Get medical attention immediately. Treatment is urgently required. Transport to a hospital.

Ingestion: Have victim rinse mouth with water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Get medical attention immediately. Treatment is urgently required. Transport to a hospital.

First Aid Comments: All first aid procedures should be periodically reviewed by a medical professional familiar with the chemical and its conditions of use in the workplace.

What are fire hazards and extinguishing media for sodium hydroxide?

Flammable Properties: Does not burn.

Suitable Extinguishing Media: Not combustible. Use extinguishing agent suitable for surrounding fire

Unsuitable Extinguishing Media: Carbon dioxide.

Specific Hazards Arising from the Chemical: Contact with water causes violent frothing and spattering. Reacts with metals to produce highly flammable hydrogen gas. Closed containers may rupture violently when heated releasing contents. Toxic sodium oxide fumes can be generated at high temperatures.

What are the stability and reactivity hazards of sodium hydroxide?

- **Chemical Stability:** Normally stable.
 - **Conditions to Avoid:** Water, moisture or humidity. Generation of dust.
 - **Incompatible Materials:** Highly reactive. Reacts violently with: many chemicals, including, water, organic acids (e.g., acetic acid), inorganic acids (e.g., hydrofluoric acid), oxidizing agents (e.g., peroxides), metals (e.g., aluminum). Corrosive to: aluminum alloys, carbon steel, and other metals.
 - **Hazardous Decomposition Products:** None known.
 - **Possibility of Hazardous Reactions:** None known.
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What are unintentional release measures for sodium hydroxide?

Personal Precautions: Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Use personal protective equipment as required. Remove or isolate incompatible materials as well as other hazardous materials.

Methods for Containment and Clean-up: Contain and soak up spill with absorbent that does not react with spilled product. Shovel or sweep dry sodium hydroxide for recycling or disposal. Flush spill area. Dike spilled product to prevent runoff.

What handling and storage practices should be used when working with sodium hydroxide?

Handling: Before handling, it is important that all engineering controls are operating and that protective equipment requirements and personal hygiene measures are being followed. Only trained personnel should work with this product. Immediately report leaks, spills or failures of the safety equipment (e.g., ventilation system). Avoid generating vapours or mists. Avoid generating dusts. Use corrosion-resistant tools and equipment. Never add water to a corrosive. Always add corrosives slowly to COLD water. Never reuse empty containers, even if they appear to be clean. Keep containers tightly closed when not in use or empty.

Storage: Store in an area that is: cool, dry, well-ventilated, separate from incompatible materials. Keep amount in storage to a minimum. Store in the original, labelled, shipping container. Vent drums to prevent pressure buildup. Do not handle swollen drums. Get expert advice. Empty containers may contain hazardous residue. Store separately. Keep closed. Contain spills or leaks by storing containers in trays made from compatible materials.

What is the American Conference of Governmental Industrial Hygienists (ACGIH®) recommended exposure limit for sodium hydroxide?

ACGIH® TLV® - STEL [C]: 2 mg/m³ C

Exposure Guideline Comments: TLV® = Threshold Limit Value. STEL = Short-term Exposure Limit. C = Ceiling limit.

Adapted from: 2022 TLVs® and BEIs® - Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati: American Conference of Governmental Industrial

NOTE: In many (but not all) Canadian jurisdictions, the exposure limits are similar to the ACGIH® TLVs®. Since legislation varies by jurisdiction, contact your local jurisdiction for exact details. A list is available in the OSH Answers on [Canadian Governmental Occupational Health & Safety Departments](#).

A list of which acts and regulations that cover [exposure limits to chemical and biological agents](#) is available on our website. Please note that while you can see the list of legislation for free, you will need a subscription to view the actual documentation.

What are the engineering controls for sodium hydroxide?

Engineering Controls: Use a local exhaust ventilation and enclosure, if necessary, to control amount in the air. It may be necessary to use stringent control measures such as process enclosure to prevent product release into the workplace. Use a corrosion-resistant exhaust ventilation system separate from other ventilation systems. Exhaust directly to the outside, taking any necessary precautions for environmental protection.

What Personal Protective Equipment (PPE) is needed when working with sodium hydroxide?

Eye/Face Protection: Wear chemical safety goggles. A face shield (with safety goggles) may also be necessary.

Skin Protection: Wear chemical protective clothing e.g. gloves, aprons, boots. [Suitable materials](#) (sodium hydroxide 30-70%) include: butyl rubber, natural rubber, neoprene rubber, nitrile rubber, polyvinyl chloride (PVC), Viton®, Viton®/butyl rubber, AlphaTec® (02-100, 4000, EVO, VPS), Kemblok®, Barrier® - PE/PA/PE, Silver Shield® - PE/EVAL/PE, Trelchem® HPS, Trelchem® VPS, Saranex®™, Chemprotex® 300, ChemMAX® (3), Frontline® 500, Tychem® BR/LV, Tychem® (5000, 6000, 6000 FR, 9000, Responder® CSM, 10000, 10000 FR), Zytron® (300, 500), Recommendations are NOT valid for very thin natural rubber, neoprene rubber, nitrile rubber, and PVC gloves (0.3 mm or less).

Respiratory Protection:

Up to 10 mg/m³:

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode*; OR Any powered air-purifying respirator with a high-efficiency particulate filter*.

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter; OR Any self-contained breathing apparatus with a full facepiece; OR Any supplied-air respirator with a full facepiece.

*Causes eye irritation or damage; eye protection needed.

APF = Assigned Protection Factor

Recommendations apply only to National Institute for Occupational Safety and Health (NIOSH) approved respirators. Refer to the [NIOSH Pocket Guide to Chemical Hazards](#) for more information.

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