BASF Chemical Emergency Medical Guidelines

Sodium hydroxide (NaOH) A 1

Information and recommendations for first responders

- **Patients whose clothing or skin is contaminated with solid sodium hydroxide or its solutions can cause secondary contamination of rescue and medical personnel by direct contact.**
- **Sodium hydroxide and its solutions, mists, and aerosols are rapidly corrosive when they come in contact with the eyes, skin, and upper respiratory tract causing irritation, burns, coughing, chest pain and dyspnea. Swelling of the throat and accumulation of fluid in the lungs (shortness of breath, cyanosis, expectoration) may occur.**
- **Ingestion of sodium hydroxide can cause severe corrosive injury to the lips, mouth, throat, esophagus, and stomach.**
- **Immediate decontamination (first removal of solid sodium hydroxide, thereafter extensive flushing of contaminated eyes, skin, and hair) is crucial**.
- **There is no antidote to be administered to counteract the effects of sodium hydroxide. Treatment consists of supportive measures.**

1. Substance information

Sodium hydroxide (NaOH), CAS 1310-73-2

Synonyms: caustic soda, sodium hydrate, lye.

At room temperature sodium hydroxide is a white crystalline, odorless, deliquescent solid, which absorbs moisture from the air. When sodium hydroxide is dissolved in water, often a mist is formed. Sodium hydroxide itself is nonflammable, but in contact with moisture it may ignite combustibles. Toxic fumes may be formed upon heating. The solid, solutions, mists, and aerosols are all corrosive.

Sodium hydroxide is widely used in the manufacture of soaps, paper, rayon, cotton, dyestuffs, and petroleum products. Other uses include etching and cleaning of metals, electroplating, ion-exchange resin regeneration, and oxide coating.

2. Routes of exposure

Inhalation

Inhalation of mists and aerosols is a relevant route of exposure. Sodium hydroxide's irritant properties generally provide adequate warning of acutely hazardous concentrations. However, prolonged or repeatedly exposed persons may develop some tolerance of the irritant effects.

Skin/eye contact

Most exposures to sodium hydroxide occur by skin contact. Direct contact with liquid sodium hydroxide or concentrated vapor or fumes on eyes or wet or moist skin causes severe chemical burns.

Ingestion

Ingestion of sodium hydroxide can cause severe corrosive injury to the lips, mouth, throat, esophagus, and stomach.

3. Acute health effects

Respiratory

Sodium hydroxide exposure usually causes dryness of the nose and throat, and coughing. Inhalation of very high concentrations may result in swelling of the throat and eventually in obstruction of the airways and death. Development of respiratory distress with chest pain, dyspnea and accumulation of fluid in the lungs (shortness of breath, cyanosis, expectoration) may occur after a delay of up to 24 hours.

Skin contact

Deep painful burns of the skin and mucous membranes may be caused by contact with concentrated sodium hydroxide. Contact with less concentrated sodium hydroxide can cause burning pain, redness, and inflammation the onset of which might be delayed for up to several hours after exposure.

Eye contact

Severe eye burns with clouding of the surface, and ensuing blindness may occur from exposure to liquid sodium hydroxide. Low concentration levels of mists or aerosols cause burning discomfort, spasmodic blinking or involuntary closing of the eyelids, redness, and tearing.

4. Actions

Rescuer self-protection

If the zone which has to be entered by the rescuer is suspected of containing sodium hydroxide mists or aerosols, pressure-demand, self-contained breathing apparatus and chemical-protective clothing shall be worn; do not use equipment that is contaminated itself.

Patients whose clothing or skin is contaminated with solid sodium hydroxide or its solutions can cause secondary contamination of rescue and medical personnel by direct contact.

Patient recovery

Patients should be removed from the contaminated zone immediately. Patients who are unable to walk may be removed on backboards or stretchers; if these are not available, carefully remove/transport patients with appropriate action to a safe zone, taking into account your self-protection.
Immediate priorities must follow the "**A, B, C's**" of resuscitation:

A) **Airway** (make sure the airway is not blocked by the tongue or a foreign body)
B) **Breathing** (check to see if the patient is breathing, provide ventilation with use of appropriate barrier devices, e.g. with a pocket face mask, if breathing is absent)
C) **Circulation** (start CPR in any unresponsive person with absent or abnormal breathing)

Decontamination

Patients exposed only to sodium hydroxide mists or aerosols who have **no evidence** of skin or eye irritation do not need decontamination. All others require decontamination.

Patients who are able and cooperative may assist with their own decontamination. If the exposure involved solid or liquid sodium hydroxide and if clothing is contaminated, remove and double-bag the clothing.

Irrigate exposed or irritated eyes with plain water or saline for at least 20 minutes. Remove contact lenses if present and easily removable without additional trauma to the eye. Continue other basic care during flushing.

If any solid sodium hydroxide is present on the patient's skin, hair or clothes, brush it away before flushing. Protect yourself and the patient's eyes.
Then, flush exposed skin and hair with plain water for at least 15 minutes. Protect eyes during flushing of skin and hair. Continue other basic care during flushing.

Immediate decontamination is crucial.

Further actions

In case of ingestion of sodium hydroxide, **do not induce emesis. Each potentially exposed person should seek immediate medical advice and treatment.**

In this document BASF has made a diligent effort to ensure the accuracy and currency of the information presented but makes no claim that the document comprehensively addresses all possible situations related to this topic. This document is intended as an additional resource for first responders in assessing the condition and managing the treatment of patients exposed to sodium hydroxide. It is not, however, a substitute for the judgement of a first responder and must be interpreted in the light of specific information regarding the patient available to such a first responder and in conjunction with other sources of authority.

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