



Material Safety Data Sheet

1. IDENTIFICATION

PRODUCT NAME: H2-CS-35

CHEMICAL NAME/SYNONYMS: caustic, caustic soda, lye, sodium hydrate, caustic soda
membrane grade 50%; caustic soda diaphragm 15%, 18%, 20%, 25%, 30%, 40%, 50%,

CHEMICAL FAMILY: base

CHEMICAL FORMULA: NaOH

For emergencies call Chemtrec at 1-800-424-9300

2. HAZARD(S) IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

EYES: Product is destructive to eye tissues on contact. Will cause severe burns that result in damage to the eyes and even blindness.

SKIN: Product is destructive to tissue contacted and produces severe burns. A latent period may exist between exposure and sense of irritation

INGESTION: Product, if swallowed, can cause severe burns and complete tissue perforation of mucous membranes of the mouth, throat, esophagus and stomach.

INHALATION: Airborne concentrations of dust, mists, or sprays of this product may cause damage to the upper respiratory tract and lung tissue proper, which could produce chemical pneumonia and can cause death, depending upon severity of exposure.

EFFECTS OF OVEREXPOSURE:

ACUTE: corrosive to all body tissues with which it comes in contact. The effect of local dermal exposure may consist of multiple areas of superficial destruction of the skin or of primary irritant dermatitis. Similarly, inhalation of dust, spray, or mists may result in varying degrees of irritation or damage to the respiratory tract issues and an increased susceptibility to respiratory illness. These effects occur only when the TLV is exceeded.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>CAS #</u>	<u>COMPONENT</u>	
<u>PERCENT</u>		
1310-73-2	sodium hydroxide	15-51
7647-14-5	Sodium chloride	<1.0
497898	Sodium carbonate	<0.2
7732-18-5	water	balance

4. FIRST-AID MEASURES

EYES: Immediately flush eyes with plenty of water for at least 30 minutes while holding eyelids open. Speed in beginning the eye wash is essential if permanent injury is to be avoided. you may have ten seconds or less to avoid serious permanent injury. Get medical attention.

SKIN: Immediately remove contaminated clothing or shoes, wipe excess from skin and flush with plenty of water for at least 30 minutes. Do not reuse clothing until thoroughly cleaned. Get medical attention.

H2-CS-35

INGESTION: Do not induce vomiting. Rinse mouth with water. If conscious, give large quantities of water or milk and get immediate medical attention. Never give anything by mouth to an unconscious person.

INHALATION: Remove victim to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Keep the victim warm and at rest. Get medical attention.

5. FIRE-FIGHTING MEASURES**GENERAL FIRE HAZARDS:**

UPPER FLAMMABLE LIMIT (UFL): N/A

LOWER FLAMMABLE LIMIT (LFL): N/A

METHOD USED: N/A

FLASH POINT: nonflammable

FLAMMABILITY CLASSIFICATION: N/A

AUTO IGNITION: N/A

EXTINGUISHING MEDIA: Use media appropriate for surrounding area.

FIRE FIGHTING EQUIPMENT/INSTRUCTIONS: approach fire from upwind to avoid hazardous vapors. Wear full protective clothing. Self-contained breathing apparatus with full face-piece operated in pressure demand or other positive pressure mode. Avoid direct contact of this product with water as this can cause a violent exothermic reaction.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NaOH will react with metals such as aluminum, tin, and zinc to generate flammable an explosive hydrogen gas.

NFPA CODES: HEALTH: 3 FIRE: 0 REACTIVITY: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

ACTIONS TO TAKE FOR SPILLS OR LEAKS: Leaks should be stopped. Spills should be contained and cleaned up immediately. Spills should be removed by using a vacuum truck. Neutralize remaining traces of materials with any dilute inorganic acid such as hydrochloric, sulfuric, nitrate, phosphoric, and acetic acid. The spill area should then be flushed with water followed by a liberal covering of sodium bicarbonate. All cleanup material should be removed and placed in the proved containers, labeled and stored in a safe place to await proper treatment or disposal. Spills on areas are other than pavement, e.g. dirt or sand, may be handled by removing the affected soils and placing in approved containers. Persons performing cleanup work should wear adequate personal protective equipment and clothing. Spills or releases should be reported, if required, to the appropriate local, state and Federal regulatory agencies. Caution: caustic soda may react violently with acids and water.

7. HANDLING AND STORAGE**STORAGE AND HANDLING:**

- Do not get into eyes, on skin, or on clothing. Avoid breathing dust, mists, or spray. Do not take internally. Use with the adequate ventilation and employ respiratory protection when needed. When handling, wear chemicals splash goggles, face shield, rubber gloves, and protective clothing. Washed thoroughly after handling product and keep containers closed. Product can react violently with water, acids, and other substances. Product is corrosive to iron, aluminum, zinc and alloys containing these metals, and will react violently with these metals in powder form. Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and can cause death. Follow appropriate tank entry procedures.
- Do not permit workers to handle caustic without proper training and proper equipment. Store in well sealed containers which are protected from physical damage. Avoid handling conditions which can lead to spills or mist formations. Drains must have

H2-CS-35

retention basins for pH adjustment and neutralization of spilled materials and flushing before discharge. Have abundant running water available where material is stored, unloaded or handled.

- Avoid storing next to strong acids. Caustic should be stored in clean, dry area. Do not store in underground tanks. Product absorbs water and CO₂ from the air.
- Caustic soda reacts with reducing sugars such as fructose, lactose, galactose, levulose, and arabinose to form carbon monoxide.

SPECIAL MIXING AND HANDLING INSTRUCTIONS:

- Product can react violently with water. Considerable heat is generated when product is mixed with water. Therefore, when making solutions always carefully follow these steps:
- Always wear ALL protective clothing. Never add water to products. Always add product with constants stirring – slowly two surface of lukewarm (80 – 100°F) water, two assure product is being completely dissolved as it is added.
- If product is added too rapidly, or without stirring, and becomes concentrated at the bottom of mixing vessel, excessive heat may be generated resulting in a dangerous boiling and spattering and possibly an immediate and violent eruption of highly caustic solution.
- Note: Never add more products than can be absorbed by solution while temperature below 200°F to prevent boiling and spattering.
- Product can react explosively with acids, aldehydes, and many other organic chemicals.
- Always empty and clean containers of all residues before adding product to avoid possible Explosive reaction between the product and unknown residue.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**EXPOSURE GUIDELINES:**

Component	Exposure Limits, MG/M3		
	OSHA PEL	ACGIH TLV	Other Limit
Sodium hydroxide	2	2	

PERSONAL PROTECTION:

VENTILATION: Local exhaust ventilation is recommended if vapors, mists or aerosols are generated. Otherwise, use general exhaust ventilation.

EYES AND FACE: Wear chemical goggles and full face-shield unless a full face-piece respirator is also worn. Do not wear contacts.

CLOTHING: Wear rubber boots, gloves and apron.

RESPIRATORY: respiratory protection is not required under normal use. Use NIOSH/MSHA approved respirators where dust, mist, or spray maybe generated.

GENERAL: An eyewash and safety shower should be nearby and ready for use.

9. PHYSICAL AND CHEMICAL PROPERTIES

	15%	20%	25%	30%	40%	50%
Molecular Weight:						
Specific Gravity: @ 15.6°C	1.17	1.22	1.28	1.34	1.44	1.54
Freeze Point in °F:	zero	-15	7.0	32	60	58
Boiling Point in °F:	221	226	234	241	264	293
Density: lb/gal	9.74	10.2	10.69	11.14	12	12.8

For all sodium hydroxide %

pH: 14.7

Vapor pressure @ 140°F (mmHg): 13

Vapor density: N/A

Evaporation Rate: N/A

Water solubility: Yes

Color: Clear

H2-CS-35

Odor: none
Appearance: clear liquid ones

10. STABILITY AND REACTIVITY

HAZARDOUS POLYMERIZATION: Hazardous Polymerization will not occur

CHEMICAL STABILITY: stable

CONDITIONS TO AVOID: avoid direct contact with water. This product may be added slowly to water or acids with dilution and agitation to avoid a violent exothermic reaction. When handling this product, avoid contact with aluminum, tin, zinc and alloys containing these metals. Avoid contact with leather, wool, acids, organic halogen compounds and organic nitro compounds.

HAZARDOUS DECOMPOSITION: not known

11. TOXICOLOGICAL INFORMATION

ACUTE ORAL: LD50 = 140-340 mg/kg (rat) LD Lo = 500 mg/kg (rabbit)

12.5% solution rat LD50 = 5G/KG

ACUTE DERMAL: LD50 = 1350mg/kg (rabbit)

INHALATION: Low levels of mist exposure result in severe pneumonitis.

CARCINOGENICITY: not listed in NTP – 1983, IARC or OSHA

HUMAN DERMAL EXPOSURE: regardless of concentrations, the severity of damage and extent of its irreversibility increases with length of contact time. Prolonged contact with even dilute sodium hydroxide solution can cause a high degree of tissue destruction. The latent period, Following skin contact during which no sensation of irritation occurs, varies from several hours for 0.4-4% solution to three minutes with 25-50% solution.

12. ECOLOGICAL INFORMATION**13. DISPOSAL CONSIDERATIONS****DISPOSAL METHODS:**

The materials resulting from cleanup operations may be hazardous waste and, therefore, subject to specific regulations. Package, store, transfer and dispose of all cleaning materials and any contaminated equipment in accordance with all applicable regulations. Shipments of waste materials may be subject to manifesting requirements per applicable regulations. Appropriate disposal will depend on the nature of each waste material and should be performed by competent and properly permitted contractors. Ensure that all required agencies receive proper notification of spills and disposal methods.

14. TRANSPORT INFORMATION

This material is regulated as a DOT Hazardous Material.

US DOT INFORMATION:

UN/NA #	Shipping Name Hazard	Class	Packing Group	ERG	RQ
UN1824,	Sodium Hydroxide Solution,	8,	II,	154	1000lbs

15. REGULATORY INFORMATION

OSHA standard 29CFR 1910.1200 Requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including the labeling, material safety data sheets, training and access to written records.

SARA/TITLE III HAZARD CATEGORIES:

Immediate (ACUTE) Health: yes Reactive Hazard: Yes Fire Hazard: No
 Delayed (CHRONIC) Health: NO Sudden Release of Pressure: No

16. OTHER INFORMATION

Do not use ingredient information and/ or ingredient percentages in this MSDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from H2O Technical Services.

DISCLAIMER:

We believe that the information in this MSDS is accurate. The suggested procedures are based on experience as of the date of publication. They are not necessarily either all-inclusive or fully adequate in every circumstance. Also, these suggestions should not be confused with or followed in violation of applicable laws, regulations, rules or insurance requirements.

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