MATERIAL SAFETY DATA SHEET
SODIUM HYDROXIDE (Solution)

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1. Product and Company Identification

Product Name	Sodium hydroxide
Structure Formula	NaOH
CAS Number	1310-73-2
Synonyms	Caustic soda, Liquid caustic
Manufaturer's Name	THASCO Chemical Co., Ltd.

2. Composition / Information on Ingredient

Substance	Concentration (by weight)
Sodium hydroxide	32%, 50%

3. Physical / Chemical Properties

Molecular Weight	40	**Melting Point (^{o}C)**	12
Boiling Point (^{o}C)	140	**Density (g/cm^{3})**	1.53
Vapor Pressure (kPa)	0.2	**Status**	Liquid
Appearance and Odor	Clear, colorless, odorless	**pH**	14
Others Physical Characteristic	Soluble in all proportions in ethanol, methanol and glycerol		

4. Fire and Explosion Hazard Data

Extinguishing Media	Use any means suitable for extinguishing surrounding fire. If water is used, should taken, precautions to generate heat.
Fire Hazard Comments	Do not allow water to get into the container, the spattering may occur. Contact with water and some substances i.e. strong acid, nitroparaffin and organohalogen compounds may generate sufficient heat to ignite nearby combustible materials. Contact with metals i.e. aluminium, tin and zinc may evolve hydrogen gas.
Special Fire Fighting Procedures	Keep windward side. Use water spray to keep fire-exposed containers cool and absorb heat.
Protective Equipments for Fire Fighters	Wear fire-resistant suit, chemical resistant suit and self-contained breathing apparatus.
Flash Point (^{o}C)	Not applicable
Autoignition Temperature (^{o}C)	Not applicable

NFPA Symbol

Flammability	0	: Will not burn
Reactivity	1	: May react with water to release energy but not violently
Health	3	: May cause serious temporary or residual injury on short-term exposure even though prompt medical attention is given.
Special data	ALK	: Alkalinity

5. Reactivity Data

Stabilization	Stable
Explosion Data	Not considered to be explosion hazard
Reaction with Water	Generate heat
Oxidation	Non-oxidizing agent
Hazardous Decomposition Products	No information available

6. Health Hazard Data

Special Precaution Extremly corrosive chemical.

Health Effects

Routes of Entry Inhalation, skin, eye and swallow

Hazard (Skin, Eye and Mucous membrane)

Causes severe irritation.

Effects of Short-Term (Acute) Exposure

Inhalation: Causes severe respiratory tract with irritation coughing, chest pain and breathing difficulty. Pulmonary edema may occur.

Skin contact : Causes severe burns with scarring. May causes penetrating ulcers of skin.

Eye contact : Causes severe irritate with ulceration, suppuration, partially blind and blindness.

Ingestion : Causes severe burn to the digestive tract and mouth. Causes vomiting, diarrhea and death.

Effects of Long-Term (Chronic) Exposure

Inhalation: May lead to constrict in respiratory system.

Skin : Cause dryness, cracking and dermatitis.

First Aid Procedure

Skin Contact Remove contaminated clothing and shoes under runnning water for at least 15 minutes. Obtain medical attention immediately.

Eye Contact Flush with running water for at least 15 minutes, occasionally lifting the eyelids. May rinse with a neutral saline solution. Do not allow the contaminated water into the non-affected eye. Obtain medical attention immediately.

Inhalation Move victim to fresh air. If breathing is difficult, give oxygen. Do not allow victim to move about unnecessarily. Obtain medical attention immediately.

Ingestion Never give anything by mouth if victim is unconscious. Rinse mouth thoroughly with water. Do not induce vomiting. Drink 240 to 300 ml. of water. If milk is available, it may be administered after the water has been given. Obtain medical attention immediately.

Exposure Guidelines TLV-C: 2 mg/m^3

Toxicological Information

Acute Toxicity

LD_{50} ingestion (mg/l)	Not information available
LD_{50} skin (mg/l)	Not information available
LC_{50} inhalation (ppm)	Not information available
Eye Contact	Severe injury
Skin Contact	Severe injury
Sub-Acute Toxicity	Severe corrosion on esophagus of experimental animal.
Allergenic Effects	Not information available

Chronic Toxicity

Carcinogenic Effects	Not classified as carcinogen but severe corrosion on esophagus can lead to cancer.
Embryologic Effects	Not information available
Teratologenic Effects	Not information available
Mutagenic Effects	Not information available
Neurogenic Effects	Not information available

7. Precaution for Handling and Use

Handling

Warning	Use adequate personal protective equipments and follow the notification of occupational health and safety and environmental authorities. The operators should be trained in handling this product. Use smallest possible safety amount in designated areas.
Precaution	Do not use with incompatible materials such as strong acids, nitroaromatic or organohalogen compounds. Never add water to a corrosive. Always add corrosives to water. Fume generation should be avoided.
Ventilation	Adequate ventilation should be provided.
Safety Handling	Inspect containers to make sure the leakage and damage before using. Do not use pressure to tranfer a corrosive. Keep containers tightly closed when not in use and when empty. Appropriate safety measures and protective equipment should be prepared.
Safety Storage	Store in a cool, dry and well-ventilated area. Restrict access to storage area with warning signs Inspect periodically for damage or leaks. Store away from compatible materials. Always store in original labelled containers. Floors should not allow liquids to penetrate. Storage tanks should be surrounded with dikes capable of holding entire contents.
Imcompatible Materials	Strong acids, Nitroaromatic, Nitroparaffinic or Organohalogen compounds.

Exposure Controls

Personal Protection	Restrict access to exposure area. Use appropriate personal protective equipments. Have a well-ventilated system.
Environment Protection	Prevent liquid run-off into sewers which lead to water ways. Use sand or soil to make a diking.
Spill and Leakage Procedures	Mop or wipe up to permitted waste disposal facilities. Flush area with water. Dilute with water dilute and neutralize with acid.

Waste Disposal Method

Products	Neutralization.
Empty Containers	Clean up with water and follow law regulations.

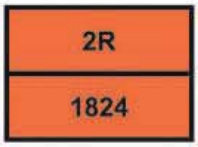
8. Control Measure

Engineering Controls	Totally enclose processes and personal. Control the condition of process. Normal ventilation is generally adequate. If generated heat or vapors, local exhaust ventilation should be provided.
Respiratory Protection	Chemical cartridge respirator with cartridge to protect against fume of sodium hydroxide.
Body Protection	Protective clothing
Hand Protection	Chemical resistant gloves
Eye Protection	Chemical safety goggles or glasses, Face shield may be used in properly.
Others Protection	Chemical resistant boots. Eyewash fountain and safety shower.

9. Regulatory Information

ORANGE SYMBOL	LABEL
80 : Corrosive substance and react violently with water. 1824 : UN Number	 For transportation. Label sizing : more than 250 x 250 mm. Picture sizing : 12.5 mm. far from edge 5 mm.

Hazchem Code



2 : Use water spray or fog to reduce or direct vapors.
R : Use chemical protective full body and self contained breathing apparatus. Dilute with water before release to sewers, water ways.
1824 : UN number

10. Transportation Information

UN Number	1824	**UN Class**	8
UN Packing Group	II	**IMDG-Ems Number**	8-06
IMDG-Class	8	**IMDG Packing Group**	II
IATA-Class	8	**IMDG-MFAG Table Numbe**	705
IATA-Packing Group	II	**Tank Number**	L4BN

11. Other Informations

Polymerization Not polymerization
Decomposition Not decomposition
Bioaccumulation Not accumulation
Ecotoxicological Information Fish: LD_{50}: 189 mg/l (1N solution = 40 g/l) EC_0 < 20 mg/l Aquatic organism: LD_{50}: 10-100 mg/l/96 h. Highly toxic to fish and plankton due to pH changing. But not result in a lack of oxygen in ecological system.