

MATERIAL SAFETY DATA SHEET



**SODIUM HYDROXIDE FLAKE 98%**

**SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT IDENTIFIER: **SODIUM HYDROXIDE, FLAKE (F-NaOH)**

RECOMMENDED USAGE: **NEUTRALIZING AGENT, INDUSTRIAL CLEANER, PULPING AND BLEACHING, CATALYST**

MANUFACTURER:

**PT ASAHIMAS CHEMICAL**

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**SECTION 2 HAZARDS IDENTIFICATION**

**GHS Classification:**

| Health  | Environmental  | Physical   |
|---|--|--|
| Acute Toxicity - Category 3<br>Eye Corrosion - Category 1A<br>Skin Corrosion - Category 1A<br>Skin Sensitization - Category 1<br>Mutagenicity - Category 1A<br>Carcinogenicity - Category 1B<br>Reproductive/Developmental - Category 1A<br>Target Organ Toxicity (Repeated) - Category 1 | Aquatic Toxicity: <ul style="list-style-type: none"> <li>Acute 1</li> <li>Chronic 1</li> </ul> | Substance which in contact with water emit flammable gasses - Category 1 |

**GHS Label:**

**Symbols:** skull and crossbones, corrosion, health hazard



**Hazard Statements**

**DANGER!**

**EXTREMELY CORROSIVE**

Fatal if inhaled.

Avoid to swallowed.

Causes severe skin burns and eye damage.

Can cause blindness, permanent scarring and death.

Toxic if swallowed and in contact with skin

Suspected of damaging the unborn child.

Suspected of causing genetic defects.

May cause damage to cardiovascular, respiratory,

nervous, and gastrointestinal systems and liver and

blood through prolonged or repeated exposure.

Harmful to aquatic life.

**Precautionary Statements**

Do not breathe mist/vapors.

Keep container tightly closed.

Wear protective gloves and eye/face protection.

Store container tightly closed in cool/ well-ventilated place.

Wash thoroughly after handling.



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**SECTION 3 COMPOSITION, INFORMATION ON INGREDIENTS**

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CHEMICAL IDENTITY: **SODIUM HYDROXIDE, FLAKE**

TRADE NAMES/SYNONYMS:

**CAUSTIC SODA; SODA LYE; LYE; WHITE CAUSTIC; BEAD; DRY; FLAKE; SOLID; SODIUM HYDRATE; SODIUM HYDROXIDE (NaOH); DRY SOLID, FLAKE, BEAD, OR GRANULAR; UN 1823; NaOH; OHS21300; RTECS WB4900000**

CAS NUMBER: **1310-73-2**

EC NUMBER (EINECS): **215-185-5**

EC INDEX NUMBER: **011-002-00-6**

MINIMUM PERCENTAGE: 98

**SECTION 4 FIRST AID MEASURES**

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**INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

**SKIN CONTACT:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before reuse. Destroy contaminated shoes.

**EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**INGESTION:** If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention.

**NOTE TO PHYSICIAN:** For inhalation, consider oxygen. Avoid gastric lavage or emesis.

**SECTION 5 FIRE FIGHTING MEASURES**

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**SUITABLE EXTINGUISHING MEDIA:** regular dry chemical, carbon dioxide, water, regular foam

Large fires: Use regular foam or flood with fine water spray.

**FIRE AND EXPLOSION HAZARDS:** Negligible fire hazard.

**FIRE FIGHTING:** Move container from fire area if it can be done without risk.

Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks.

**SECTION 6 ACCIDENTAL RELEASE MEASURES**

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- PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT & EMERGENCY PROCEDURES:

- ENVIRONMENT PRECAUTION:

**SOIL RELEASE:** Dig holding area such as lagoon, pond or pit for containment. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water.

**WATER RELEASE:** Neutralize.

- METHODS & MATERIALS FOR CONTAINMENT & CLEANING UP

Do not touch spilled material. Stop leak if possible without personal risk.

**Small spills:** Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal.



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**Small dry spills:** Move containers away from spill to a safe area.

**Large spills:** Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304).

#### SECTION 7 HANDLING AND STORAGE

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**- PRECAUTIONS FOR SAFE HANDLING:**

Use smallest possible amounts in designated areas with adequate ventilation. Keep containers closed when not in use. Empty containers may contain hazardous residues. Transfer solids using tools or equipment, which are corrosion - resistant. Cautiously, transfer into sturdy containers made of compatible materials. Never return contaminated material to its original container. Considerable heat is generated when diluted with water. Proper handling procedures must be followed to prevent vigorous boiling, splattering or violent eruption of the diluted solution. Never add water to caustic. **ALWAYS ADD CAUSTIC TO WATER** and provide agitation. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation. In general, keep solid sodium hydroxide away from water. Post "DO NOT USE WATER" signs in area of use to prevent accidental contact

**- PRECAUTIONS FOR SAFE STORAGE (including any incompatibilities):**

Store in a cool, dry, well-ventilated area. This material absorbs water. Keep containers tightly closed when not in use and when empty. Protect from damage.

Store away from incompatible materials such as strong acids, nitroaromatic, nitroparaffinic or organohalogen compounds. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. Containers made of nickel alloys are preferred. Steel containers are acceptable if temperatures are not elevated. Nickel is the preferred metal for handling this product. Plastics or plastic-lined steel, or FRP tanks of derakane vinyl ester resin may be suitable. If outdoor storage of pearl caustic is unavailable, the pallets should be protected against extremes of weather. Do not expose sealed containers to temperatures above 40°C (104°F)

#### SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

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**- CONTROL PARAMETERS:**

**OCCUPATIONAL EXPOSURE LIMIT or BIOLOGICAL LIMIT VALUE:**

2 mg/m<sup>3</sup> OSHA TWA

2 mg/m<sup>3</sup> OSHA ceiling (vacated by 58 FR 35338, June 30, 1993)

2 mg/m<sup>3</sup> ACGIH ceiling

2 mg/m<sup>3</sup> NIOSH recommended ceiling

2 mg/m<sup>3</sup> UK OES STEL

MEASUREMENT METHOD: Particulate filter; Hydrochloric acid; Titrate; NIOSHIV # 7401, Alkaline Dusts

**- APPROPRIATE ENGINEERING CONTROLS:**

Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact. VENTILATION: Ensure compliance with applicable exposure limits.

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#### PERSONAL PROTECTIVE EQUIPMENT



Maintain eye wash fountain and quick-drench facilities in work area. Detailed requirements for personal protective equipment should be established on a site-specific basis.

**EYE PROTECTION:** Wear full face-shield and chemical safety goggles when there is potential for contact.

**Skin Protection:** Wear appropriate personal protective clothing to prevent skin contact. Chemical protective clothing composed of natural rubber, neoprene, nitrile, or styrene/butadiene (SBR)-coated fabric is highly recommended, having break through times greater than one hour. Butyl rubber, polyethylene, chlorinated polyurethane, or polyvinyl alcohol may be used but data suggests breakthrough times of approximately an hour or more.

#### RESPIRATORY PROTECTION:

Up To 10 mg/m<sup>3</sup> : Supplied Air Respirator (SAR) operated in a continuous-flow mode, eye protection needed; or full-facepiece respirator with high-efficiency particulate filter(s); or powered air-purifying respirator with dust and mist filter(s), eye protection needed; or full-facepiece Self-Contained Breathing Apparatus (SCBA); or full-facepiece SAR.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full-facepiece SAR; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SAR.

ESCAPE: Full-facepiece respirator with high-efficiency particulate filter(s); or escape-type SCBA

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

#### APPEARANCE

PHYSICAL STATE: Solid or Flake

COLOR: white or Grayish

CHANGE IN APPEARANCE: hygroscopic

ODOR: odorless

ODOR THRESHOLD: Not available

MOLECULAR FORMULA: Na-O-H

MOLECULAR WEIGHT: 40.00

PH: 14 (5% solution)

MELTING POINT: 604 F (318 C)

BOILING POINT: 2534 F (1390 C)

FLASH POINT: Not available

EVAPORATION RATE: Not applicable

FLAMMABILITY (solid, gas): Not available

VAPOR PRESSURE: 100 mmHg @ 1111 C

VAPOR DENSITY: Not applicable

RELATIVE GRAVITY (water=1): 2.130

SOLUBILITY IN WATER: VERY soluble (111 g/100 mL at 20 ° C(68 ° F))

#### SOLVENT SOLUBILITY:

Soluble: alcohol, glycerol

Insoluble: acetone, ether

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PARTITION COEFICIENT *n-octanol / water*: Not available  
AUTO-IGNITION TEMPERATURE: Not available  
DECOMPOSITION TEMPERTURE: Not available

**SECTION 10 STABILITY AND REACTIVITY**

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- CHEMICAL STABILITY: Stable at room temperature. Rapidly absorbs carbon dioxide from the air, forming sodium carbonate. Slowly absorbs moisture from the air
- POSSIBILITY OF HAZARDOUS REACTIONS:  
REACTIVITY: May react with evolution of heat on contact with water.
- CONDITIONS TO AVOID: Water, moisture, and air. Dangerous gases may accumulate in confined spaces. May ignite or explode on contact with combustible materials.
- INCOMPATIBILITIES: combustible materials, acids, halo carbons, metals, halogens, oxidizing materials, peroxides, metal salts
- HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition ; SODIUM OXIDE
- POLYMERIZATION: Will not polymerize. However, it can induce hazardous polymerization of acetaldehyde, acrolein, and acrylonitrile.

**SECTION 11 TOXICOLOGICAL INFORMATION**

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**IRRITATION DATA:**

1 percent/24 hour(s) eyes-monkey severe; 500 mg/24 hour(s) skin-rabbit severe; 400 ug eyes-rabbit mild; 1 percent eyes-rabbit severe; 50 ug/24hour(s) eyes-rabbit severe; 1 mg/24 hour(s) eyes-rabbit severe; 1 mg/30second(s) rinsed eyes-rabbit severe

**TOXICITY DATA:**

1350 mg/kg skin-rabbit LD<sub>50</sub>; 104-340 mg/kg oral-rat LD<sub>50</sub>; 40 mg/kg intra peritoneal-mouse LD<sub>50</sub>; 500 mg/kg oral-rabbit LDLo

**LOCAL EFFECTS:**

Corrosive: inhalation, skin, eye, ingestion

**ACUTE TOXICITY LEVEL:**

Toxic: ingestion

Moderately Toxic: dermal absorption

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:**

eye disorders, skin disorders and allergies

**MUTAGENIC DATA:**

cytogenetic analysis - grasshopper parenteral 20 mg; cytogenetic analysis hamster lung 10 mmol/L;  
cytogenetic analysis - hamster ovary 16 mmol/L

**HEALTH EFFECTS:**

**INHALATION:**

ACUTE EXPOSURE: Effects due to inhalation of dusts or mist may vary from mild irritation of the nose at 2 mg/m<sup>3</sup> to severe pneumonitis depending on the severity of exposure. Low concentrations may cause mucous membrane irritation with sore throat, coughing, and dyspnea. Intense exposures may result in destruction of mucous membranes and delayed pulmonary edema or pneumonitis. Shock may occur.

CHRONIC EXPOSURE: Prolonged exposures to high concentrations of dusts or mists may cause discomfort and ulceration of the nasal passages. Repeated exposures of 5000 mg/L were harmless to rats, but 10,000

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mg/L led to nervousness, sore eyes, diarrhea and retarded growth. Rats exposed 30 minutes/day to unmeasured concentrations of sodium hydroxide aerosols suffered pulmonary damage after 2-3 months. Death occurred in 2 of 10 rats exposed to an aerosol of 40% aqueous sodium hydroxide for 30 minutes, twice a week for 3 weeks. Histopathological examination showed mostly normal lung tissue with foci of enlarged alveolar septae, emphysema, bronchial ulceration, and enlarged lymph adenoidal tissues. An epidemiologic study of 291 workers chronically exposed to caustic dusts for 30 years or more found no significant increase in mortality in relation to duration or intensity of such exposures.

#### **INGESTION:**

ACUTE EXPOSURE: The reported lethal dose in rats is 140-340 mg/kg. Ingestion may cause a burning sensation in the mouth, corrosion of the lips, mouth, tongue and pharynx, and severe esophageal and abdominal pain, vomiting of blood and large pieces of mucosa, and bloody diarrhea. Asphyxia can occur from swelling of the throat. Mediastinitis, alkalemia, pallor, weak, slow pulse, cardiovascular collapse, shock, coma and death may occur. Perforation of the alimentary tract and constrictive scarring may result. Esophageal stricture may occur weeks, months, or even years later to make swallowing difficult. The estimated fatal dose in man is 5 grams. Cases of squamous cell carcinoma of the esophagus have occurred with latent periods of 12 to 42 years after ingestion. These cancers were believed to be sequela of tissue destruction and possibly scar formation rather than the result of direct carcinogenic action of sodium hydroxide.

CHRONIC EXPOSURE: Depending on the concentration, repeated ingestion of alkaline substances may result in inflammatory and ulcerative effects on the oral mucous membranes and other effects as with acute ingestion.

#### **SKIN CONTACT:**

ACUTE EXPOSURE: Upon contact with the skin, damage including redness, cutaneous burns, skin fissures and white eschars may occur without immediate pain. Exposure to solutions as weak as 0.03 N (0.12%) for 1 hour has caused injury to healthy skin. With solutions of 0.4-4%, irritation does not occur until after several hours. Solutions of 25-50% caused no sensation of irritation within 3 minutes in human subjects. Skin biopsies from human subjects having 1 N sodium hydroxide applied to their arms for 15 to 180 minutes showed progressive changes beginning with dissolution of the cells in the horny layer and progressing through edema to total destruction of the epidermis in 60 minutes. A 5% aqueous solution caused severe necrosis to the skin of rabbits when applied for 4 hours. Alkalies penetrate the skin slowly. The extent of injury depends on the duration of contact. If sodium hydroxide is not removed from the skin, severe burn with deep ulceration may occur. Exposure to the dust or mist may cause multiple small burns and temporary loss of hair. Pathologic findings due to alkalies may include gelatinous, necrotic areas at the site of contact.

CHRONIC EXPOSURE: Effects are dependent upon concentration and duration of exposure. Dermatitis or effects similar to those for acute exposure may occur.

#### **EYE CONTACT:**

ACUTE EXPOSURE: Contact may cause disintegration and sloughing of conjunctival and corneal epithelium, corneal opacification, marked edema and ulceration. After 7 to 13 days either gradual recovery begins or there is progression of ulceration and corneal opacification. Complications of severe eye burns are symblepharon with overgrowth of the cornea by a vascularized membrane, progressive or recurrent corneal ulceration and permanent corneal opacification. Blindness may occur.

CHRONIC EXPOSURE: Effects are dependent upon concentration and duration of exposure. Conjunctivitis or effects similar to those for acute exposure may occur.



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**SECTION 12 ECOLOGICAL INFORMATION**

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ECOTOXICITY:

FISH TOXICITY: 240 ug/L 96 hour(s) LC<sub>50</sub> (Mortality) Bluegill (*Lepomis macrochirus*)

INVERTEBRATE TOXICITY: 330000-1000000 ug/L 48 hour(s) LC<sub>50</sub> (Mortality) Cockle (*Cerastoderma edule*)

ALGAL TOXICITY: 765 ug/L 30 day(s) (Biomass) Algae, phytoplankton, algal mat (Algae)

PHYTOTOXICITY: 230 ug/L 21 week(s) (Biomass) Waterweed (*Elodea canadensis*)

FATE AND TRANSPORT:

BIOCONCENTRATION:

1066 ug/L 32 hour(s) BCF (Residue) Fathead minnow (*Pimephales promelas*) 3.1 ug/L

ENVIRONMENTAL SUMMARY: Highly toxic to aquatic life.

**SECTION 13 DISPOSAL CONSIDERATIONS**

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Review federal, state and local government requirements prior to disposal. Do not dispose of waste with normal garbage, or to sewer systems. Whatever cannot be saved for recovery or recycling, including containers, should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options.

**SECTION 14 TRANSPORT INFORMATION**

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U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Sodium hydroxide, solid

ID NUMBER: UN1823

HAZARD CLASS OR DIVISION: 8

PACKING GROUP: II

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR/RID:

PROPER SHIPPING NAME: Sodium hydroxide, solid

UN NUMBER: UN1823

ADR/RID CLASS: 8

CLASSIFICATION CODE: C6

PACKING GROUP: II

AIR TRANSPORT IATA/ICAO:

PROPER SHIPPING NAME: Sodium hydroxide, solid

UN/ID NUMBER: UN1823

IATA/ICAO CLASS: 8

PACKING GROUP: II

MARITIME TRANSPORT IMDG:

PROPER SHIPPING NAME: Sodium hydroxide, solid



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UN NUMBER: UN1823  
IMDG CLASS: 8  
PACKING GROUP: II

**SECTION 15 REGULATORY INFORMATION**

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U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): 1000 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):  
Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):  
Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: Yes

CHRONIC: No

FIRE: No

REACTIVE: Yes

SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (ASSIGNED):

C Corrosive

EC Classification may be inconsistent with independently-researched data.

DANGER/HAZARD SYMBOL:

C Corrosive

EC RISK AND SAFETY PHRASES:

R 35 Causes severe burns.

S ½ Keep locked-up and out of reach of children.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

CONCENTRATION LIMITS:

C >= 5% C R 35

2% <= C < 5% C R 34

0.5% <= C < 2% Xi R 36/38

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GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 1

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

**SECTION 16 OTHER INFORMATION**

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Revise: 4

Date: August 20, 2009

MSDS SUMMARY OF CHANGES

SECTION 2 HAZARDS IDENTIFICATION Follow with GHS requirement

Change ASC LOGO

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