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MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION

Revision Date July 2011

Product Name SODIUM HYDROXIDE, SOLID

Other Names CAUSTIC SODA; SODA LYE; SODIUM HYDRATE; SOLID CAUSTIC SODA; WHITE CAUSTIC;

Uses Chemical manufacture, rayon and cellophane, neutralising agent in petroleum refining, pulp and paper, aluminium, detergents, soap, textile processing, vegetable-oil refining, reclaiming rubber, regenerating ion exchange resins, organic fusions, peeling of fruits and vegetables in food industry, laboratory reagent, etching and electroplating, food additive.

Contact Information

Organisation	Location	Telephone	Ask For
Price Chemicals Pty Ltd	10 Pile Rd Somersby NSW 2250 Australia	+61 2 97333000	Technical Officer
Poison Information Centre	Westmead NSW Australia	131126	
Chemcall 24 Hour Emergency Number	Australia	1800-127406	
	New Zealand	0800-243622	
National Poisons Centre	New Zealand	0800-764766	

2. HAZARD IDENTIFICATION

Hazardous according to criteria of NOHSC/ASCC.
Dangerous According to the Australian Code for the Transport of Dangerous Goods.
Classified as Dangerous Goods According to NZS 5433:1999.
CORROSIVE

Risk Phrases

R35 Causes severe burns.

R41 Risk of serious eye damage.

Safety Phrases

S1/2	Keep locked up and out of the reach of children.
S22	Do not breathe dust.
S24/25	Avoid contact with skin and eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

ERMA New Zealand Approval Code HSR001547

HSNO Hazard Classification 6.1D 8.1A 8.2B 8.3A 9.1D 9.3C

This Material Safety Data Sheet may not provide exhaustive guidance for all HSNO Controls assigned to this substance. The ERMA Web Site should be consulted for a full list of triggered controls and cited regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	CAS Number	Proportions (%)
SODIUM HYDROXIDE	[1310-73-2]	100.0

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure.

Swallowed Rinse mouth with water. Give water to drink provided victim is conscious. Do NOT induce vomiting. Seek medical attention immediately.

Eye Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Seek immediate medical attention.

Skin Remove contaminated clothing. Wash affected area with plenty of water. Seek medical attention immediately. Wash clothing before reuse.

Inhaled Remove victim from exposure to fresh air - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm and at rest. If not breathing, apply artificial respiration. If breathing is difficult, give oxygen. Seek immediate medical attention.

Advice to Doctor Treat symptomatically based on individual reactions of patient and judgement of doctor.

Aggravated medical conditions caused by exposure Persons with skin or lung diseases may be at an increased risk due to the toxic effects of this chemical on these organs.

5. FIRE FIGHTING MEASURES

Extinguishing Media In case of fire, use appropriate extinguishing media most suitable for surrounding fire conditions. Suitable media may include fine water spray, normal foam, dry agent such as carbon dioxide or dry chemical powder. Use water spray to cool fire exposed containers. Caution: heat may be evolved on contact with water.

Hazards from Combustion Products Non-combustible solid. Avoid generating dust. When involved in a fire, this product may emit toxic sodium oxide gases. The heat generated by contact with water (heat of dilution) may be sufficient to ignite other combustible materials.

Special Protective Precautions and Equipment for Fire Fighters Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves). Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Control run off water and prevent it from entering water courses or drainage systems.

Flammability Conditions Product is a non-flammable solid.

Additional Information

Hazchem Code 2W

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures Personnel involved in the clean up should wear full protective clothing. Evacuate all unnecessary personnel. Eliminate all sources of ignition. Increase ventilation. Avoid generating dust. Stop leak if safe to do so. Isolate the danger area. Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Management. Use corrosion-resistant and spark-proof tools and equipment.

Methods and Materials for Containment and Clean Up Contain and sweep/shovel up spills with dust binding material or use an industrial vacuum cleaner. Transfer to a suitable, labelled chemical-waste container and dispose of promptly as hazardous waste. Never neutralise the solid product. Prevent the product from becomming damp. Reactive with water. In the case of a solid, anhydrous sodium spill on soil, groundwater pollution will occur if precipitation occurs prior to cleanup. Precipitation will dissolve some of the solid (with much heat given off) and create an aqueous solution of sodium hydroxide, which then would be able to infiltrate the soil. Spills on areas other than pavement, such as dirt or sand, may be handled by removing the affected soils and placing in approved containers.

7. HANDLING AND STORAGE

Precautions for Safe Handling Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Take precautionary measures if there is any residue from products such as aluminim, tin, zinc, acid products, or organic products. Prevent the product from becoming damp or aerated. Becomes carbonated in contact with air or moisture. Being hygroscopic, it absorbs moisture and its lixiviates make the ground alkaline. Take precautionary measures against static discharges by bonding and grounding equipment. Avoid incompatible materials. Never neutralise the solid product. Avoid contact with eyes, skin and clothing. Do not inhale vapour/fumes. Caustic soda reacts readily with various reducing sugars to produce carbon monoxide. Precautions shoud be taken including atmospheric monitoring of the tank to ensure personnel. Heat is generated when mixed with water. Spattering, boiling and violent eruptions may occur.

Conditions for Safe Storage (Including Any Incompatibles) Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in section 10. Store away from foodstuffs. The floor must be waterproof and anti-slip. Hygroscopic product. Protect from direct sunlight and moisture. Store between 5-30'C. This product has a UN classification of 1823 and a Dangerous Goods Class 8 (corrosive) according to The Australian Code for the Transport of Dangerous Goods by Road and Rail.

Container Type Packaging must comply with requirements of Hazardous Substances (Packaging) Regulations 2001. Store in original packaging as approved by manufacturer.

Recommended: Carbon steel, carbon steel drums, polythene sacks or Big-Bags. Unsuitable : Aluminium, tin, zinc, and alloys (bronzes), chrome and lead.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National Exposure Standards The following exposure standard has been established by The Australian Safety and Compensation Council (ASCC); Sodium Hydroxide CAS: 1310-73-2 TWA = 2mg/m3 Peak Limitation NOTE: The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. Peak Limitation - a ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes. These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Biological Limit Values No information available on biological limits for this product.

Engineering Controls A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Caustic soda reacts readily with various reducing sugars to produce carbon monoxide. Precautions shoud be taken including atmospheric monitoring of the tank to ensure personnel.

Personal Protection RESPIRATOR: Wear a full facepiece respirator with dust filter (P1 or P2) where dusts are generated and engineering controls are inadequate (AS1715/1716) EYES: Chemical goggles (AS1336/1337). HANDS: Wear impervious nitrile gloves (AS2161). CLOTHING: Long-sleeved protective clothing and safety footwear (AS3765/2210)

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance White, Translucent Solid Beads, Blocks, Flake, Pearl, or Prill

Formula NaOH

Odour Odourless

Vapour Pressure 0 mmHg (20'C)

Vapour Density Not applicable.

Boiling Point >999'C deg C

Melting Point 318'C deg C

Solubility in Water 420g/L (20'C)

Specific Gravity 2.13 (20'C) (Water = 1)

Flash Point Not applicable.

pH >14 (20'C)

Lower Explosion Limit Not applicable.

Upper Explosion Limit Not applicable.

Ignition Temperature Not applicable.

Specific Heat Value Not applicable.

Particle Size Not applicable.

Volatile Organic Compounds (VOC) Content Not applicable.

Evaporation Rate Not applicable.

Viscosity Not applicable.

Percent Volatile Not applicable.

Octanol/Water partition coefficient Not relevant

Saturated Vapour Concentration Not applicable.

Additional Characteristics Not applicable.

Flame Propagation/Burning Rate of Solid Materials Not applicable.

Properties of Materials That May Initiate or Contribute to Fire Intensity Not applicable.

Potential for Dust Explosion Not applicable.

Reactions that Release Flammable Gases Reacts with metals to generate flammable hydrogen gas.

Fast of Intensely Burning Characteristics Not applicable.

Non-flammables That Could Contribute Unusual Hazards to a Fire Not applicable.

Release of Invisible Flammable Vapours and Gases Not applicable.

Decomposition Temperature Not applicable.

Additional Information Solids Content : 100.0% Organic Solvents : 0.0% N-octanol/water : Not relevant for ionisable compounds.

10. STABILITY AND REACTIVITY

Chemical Stability Product is stable under directed conditions of use, storage and temperature. Hygroscopic. Will absorb moisture from the atmosphere.

Conditions to Avoid Avoid excessive heat, dusty conditions, direct sunlight, moisture, static discharges, contact with foodstuffs and high temperatures. Do not expose to the elements for excessive periods, to prevent degradation of the container.

Incompatible Materials Incompatible with oxidising agents, acids, nitriles, alkaline earth metals in powdered form, ammonium compounds, cyanides, magnesium, organic nitro compounds, organic combustible substances, halogenated organics, phenols, glycols, chlorinated hydrocarbons, nitromethane, and nitroparaffins. Incompatible with metals such as aluminium, tin, zinc, copper, lead, brass and alloys of these metals. Also incompatible with water.

Hazardous Decomposition Products When involved in a fire, this product may emit toxic sodium oxide gases. The heat generated by contact with water (heat of dilution) may be sufficient to ignite other combustible materials. Reacts with metals liberating flammable hydrogen gas. Highly exothermal reaction with strong acids and water. Caustic soda forms salts with nitromethane and nitroparaffins that explode on impact.

Hazardous Reactions Hazardous polymerization does not occur. Reacts dangerously with metals, acetic acid, allyl chloride, chlorine trifluoride, chloroform, methylic alcohol, chloronitrotoluene, chlorosulphonic acid, glyoxal, cyanohydrin, hydrochloric acid, hydrofluoric acid, hydroquinone, nitric acid, sulphuric acid and oleum, nitropropane, phosphorous, propiolactone, phosphorous pentoxide, tetrachloro- benzene, tetrahydrofuran, nitromethanes, nitroparaffins, etc. Caustic soda also reacts readily with various reducing sugars such as fructose, lactose, maltose, and dry whey solids to produce carbon monoxide. Heat is generated when mixed with water. Spattering, boiling and violent eruptions may occur.

11. TOXICOLOGICAL INFORMATION

Toxicity Data Oral LD50 Rat : 2000mg/Kg Oral LDL0 Rabbit : 500mg/Kg Dermal Rabbit, Adult : 500mg/24hr - Severe irritation Eye Rabbit, Adult : 50mg/24hr - Severe irritation IPR LD50 Mouse : 40mg/Kg Health Effects – Acute

Swallowed Corrosive! Swallowing may cause severe burns of mouth, throat, and stomach, as well as diarrhoea and vomiting, from which collapse may result. Vomitus usually contain blood and possible tissue. All tissues which come in contact with this chemical may be damaged. Death may result from ingestion. If patient survives, permanent damage to the gastrointestinal tract may occur and the person may have permanent diffculty in swallowing. May cause perforation of esophagus, stomach and intestines.

Eye Corrosive! Risk of serious eye damage. Eye contact with caustic soda solid, dust, mist or solution usually results in immediate pain. Can cause ulceration or the conjunctiva and cornea with permanent eye damage including blindness.

Skin Corrosive! Caused severe burns. Skin contact may result in irritation which may not be immediately painful. Greater exposure results in severe burns, and ulcers with scarring.

Inhaled Inhalation causes respiratory irritation which may develop into serious lung injury depending on the degree of exposure. Serious pneumonia may develop. Prolonged exposures may result in upper respiratory irritation and ulceration of the nasal passage. High levels may cause permanent lung injury.

12. ECOLOGICAL INFORMATION

Ecotoxicity Onchorhynus mykiss LC50/96hr : 45.4mg/L L.macrochirus LC50/48hr : 99mg/L Daphnia Magna EC50/24hr : 76mg/L Material is slightly toxic to aquatic organisms on an acute basis (LC50 between 10 and 100mg/L in most sensitive species). May cause pH shifts outside the range of 5-10 standard units; this change may be toxic to aquatic organisms.

Persistence and Degardability Strong alkaline substances that dissociates fully. The concentration of OH-(pH) is in general regulated by equilibria between CO2, HCO3- and CO32-. In general the buffer capacity depends on the concentration of these substances.

Mobility Very mobile in soil and very soluble in water. In the case of a solid, anhydrous sodium spill on soil, groundwater pollution will occur if precipitation occurs prior to cleanup. Precipitation will dissolve some of the solid (with much heat given off) and create an aqueous solution of sodium hydroxide, which then would be able to infiltrate the soil. However, prediction of the concentration and properties of the solution produced would be difficult.

Environmental Fate (Exposure) Do NOT let product reach waterways, drains and sewers. The hazard for the environment is caused by the hydroxyl ion (pH effect).

Bioaccumulative Potential No information available on bioaccumulation for this product.

13. DISPOSAL CONSIDERATIONS

Disposal Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility.

Special Precautions for Land Fill or Incineration Contact a specialist disposal company or the local waste regulator for advice. The product can be neutralised using highly diluted hydrochloric acid, which should be added very slowly by specialised personnel wearing proper protection. NEVER NEUTRALISE THE SOLID PRODUCT.

14. TRANSPORT INFORMATION

Land Transport (Australia)

Regulation Name ADG Code

UN Number 1823

Shipping Name SODIUM HYDROXIDE, SOLID

Dangerous Goods Class 8 Corrosive Substance

Subsidiary Risk Not applicable.

Pack Group II

Precaution for User CORROSIVE

Hazchem Code 2W

EPG 37 TOXIC AND/OR CORROSIVE SUBSTANCES Non-Combustible

Special Provision Not applicable.

Land Transport (New Zealand)

Regulation Name NZS5433

UN Number 1823

Shipping Name SODIUM HYDROXIDE, SOLID

Dangerous Goods Class 8 Corrosive Substance

Subsidiary Risk Not applicable.

Pack Group II

Precaution for User CORROSIVE

Hazchem Code 2W

EPG 37 TOXIC AND/OR CORROSIVE SUBSTANCES Non-Combustible

Special Provision Not applicable.

Sea Transport

Regulation Name IMDG Code

UN Number 1823

Shipping Name SODIUM HYDROXIDE, SOLID

Dangerous Goods Class 8 Corrosive Substance

Subsidiary Risk Not applicable.

Pack Group II

Precaution for User CORROSIVE

Hazchem Code No data available.

EPG 37 TOXIC AND/OR CORROSIVE SUBSTANCES Non-Combustible

Special Provision Not applicable.

15. REGULATORY INFORMATION

Poisons Schedule 6

EPG 37

AICS Name SODIUM HYDROXIDE (Na(OH))

NZ Toxic Substance 3

HSNO Hazard Classification 6.1D 8.1A 8.2B 8.3A 9.1D 9.3C

ERMA Approval Code HSR001547

16. OTHER INFORMATION

Literature References No data available.

Sources for Data No data available.

Legend to Abbreviations and Acronyms

< less than

> greater than

ADG Australian Dangerous Goods Code

AICS Australian Inventory of Chemical Substances

CAS Chemical Abstracts Service (Registry Number)

cm2 square centimetres

CO2 Carbon Dioxide

COD Chemical Oxygen Demand

deg C ('C) degrees Celsius

ERMA Environmental Risk Management Authority

g gram

g/cm3 grams per cubic centimetre

g/l grams per litre

HSNO Hazardous Substance and New Organism

IATA International Air Transport Association Dangerous Goods Regulations

IDLH Immediately Dangerous to Life and Health

IMDG International Maritime Dangerous Goods Code

immiscible liquids are insoluble in each other

kg kilogram

kg/m3 kilograms per cubic metre

LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.

LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals

ltr Litre

m3 cubic metre

mbar millibar

mg milligram

mg/24H milligrams per 24 hours

mg/kg milligrams per kilogram

mg/m3 milligrams per cubic metre

Misc miscible

miscible liquids form one homogeneous liquid phase regardless of the amount of either component present

mm millimetre

mPa.s milli Pascal per second

N/A Not Applicable

NOHSC National Occupational Health and Safety Commission

OECD Organization for Economic Co-oeration and Development

PEL Permissible Exposure Limit

ppb parts per billion

ppm parts per million

ppm/2h parts per million per 2 hours

ppm/6h parts per millionper 6 hours

RCP Reciprocal Calculation Procedure

STEL Short Term Exposure Limit

TLV Threshold Limit Value

tne tonne

TWA Time Weighted Average

ug/24H micrograms per 24 hours

UN United Nations (number)

wt weight

This MSDS summarises Price Chemicals Pty Ltd best knowledge of the health and safety hazard information of the selected substance and how to safely handle the selected substance in the workplace however Price Chemicals Pty Ltd expressly disclaims that the MSDS is a representation or guarantee of the chemical specifications for the substance.

Each user should read the MSDS and consider the information in the context of how the selected substance will be handled and used in the workplace including its use in conjunction with other substances.