MATERIAL SAFETY DATA SHEET SODIUM HYPOCHLORITE

1. Product Identification

Trade Name:	Sodium Hypochlorite
Chemical Family:	Inorganic Hypochlorite
Chemical Name:	Sodium Hypochlorite
Synonyms:	Javel water, Household bleach
Molecular Formula:	NaOCl
Chemical Abstracts No:	7681-52-9
EINECD No:	231-668-3
NIOSH No:	NH3486300
Hazchem Code:	2R
UN No:	1791

2. Composition

Chemical identity:	Substance
Other means of identity:	Clear yellowish-green liquid
Common name, synonyms, etc:	Liquid bleach, soda
CAS number:	7681-52-9
EC number:	231-668-3
IUPAC names:	Hypochlorous acid, sodium salt
Stabilizing additives:	Sorbitol (< 0.5%), sodium hydroxide (2.7 – 2.9%)
Impurities:	< 0.7% Sodium chlorate,

Hazardous components

Name	CAS #	Concentration reported
Sodium hypochlorite	7681-52-9	15% m/v available chlorine
Sodium hydroxide	1310-73-2	1.5–2.95%

EEC Classification	(C; R31) Corrosive; Contact with acids liberate toxic gas. Causes burns
Risk Phrases	R:31-34 Contact with acids liberate toxic gas. Causes burns.

R:36 Irritating to eyes

R:38 Irritation to skin

Safety Phrases	S (1/2-) 28-45-50 Keep locked up and out of the reach of children

After contact with skin, wash immediately with plenty of water. In case of accident or if you feel unwell, seek medical advice immediately (show label where possible). Do not mix with acids

3. Hazards identification

Hazard rating (NFPA Classification) Health Hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0
Specific Hazard:	OX Chemical Hazardous Chlorine gas is released on contact with acids, oxygen is released by contact with metals. Contact with ammonia and urea produce nitrogen gas and chloramines. Contact with oxidizable material produces heat, which may generate chlorine gas.

Main Hazards Highly corrosive material which caused severe irritation of the mucous membranes of the eyes and may result in permanent damage if not treated promptly.

A severe skin irritant and repeated exposure can lead to sensitization

Inhalation can result in irritation of the respiratory tract., severe lung damage, edema and finally death. If ingested may cause severe irritation of the digestive tract, irritation, pain, inflammation, perforation, vomiting, shock, confusion, delirium, coma and death.

Health Effects – Eyes Highly corrosive solution. Causes severe irritation of the mucous membranes of the eyes. May cause permanent damage if not treated promptly

Health Effects – Skin Highly corrosive solution. Causes severe skin irritation with blistering and ulceration. May cause temporary or permanent damage if not treated promptly.

Health Effects – Ingestion Highly corrosive solution. May cause sever irritation of the mouth, throat, and digestive tract. May cause permanent damage if not treated promptly. May lead to shock, abdominal cramps, nausea, vomiting, diarrhoea convulsions, coma, and death.

Health Effects – Inhalation May cause irritation of the nose and throat, coughing, difficulty breathing; may cause pulmonary edema.

4. First aid measures

Product in Eye Immediately flush the contaminated eye(s) with gently flowing water for at least 20-30 minutes, by the clock, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. If irritation persists, repeat flushing. Neutral saline solution may be used as soon as it is available. DO NOT INTERUPT FLUSHING. If necessary, keep emergency vehicle waiting. Quickly transport victim to an emergency medical facility.

Product on Skin As quickly as possible, thoroughly flush contaminated area with running water or shower for at least 15 minutes. If irritation persists, repeat flushing. Under running water, remove contaminated clothing, shoes, and leather goods. All contaminated clothing must be laundered before reuse.

Obtain medical attention immediately

Product Ingested Have victim rinse mouth thoroughly with water. Do not induce vomiting. If conscious give one cup (250-300ml) of water to drink immediately. Give repeated drinks of water at a rate of one cup every ten minutes. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Never give anything by mouth to an unconscious person.

Check breathing and pulse. If breathing has stopped trained personnel should give artificial respiration. If heart has stopped give cardiopulmonary resuscitation (CPR)

Immediately transport victim to an emergency facility.

Product Inhaled Can release corrosive chlorine gas. Take proper precautions to ensure your own safety before attempting rescue. (e.g., wear appropriate protective equipment) Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administrated by trained personnel, preferably on a doctor's advice. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary oedema can be delayed up to 48 hours after exposure. Avoid mouth to mouth contact by using mouth guards or shields

Immediately transport victim to an emergency facility.

5. Firefighting measures

Extinguishing Media Material is non-flammable but is decomposed by heat and light causing a pressure build up in containers which could result in an explosion.

Small fires – use dry chemical or CO_2

Large fires – Water spray, fog or foam. Do not get water inside containers, move containers from fire area if without risk. Cool containers with water from maximum distance until well after the fire is out.

Use appropriate media to extinguish surrounding fire.

Special Hazards Sodium hypochlorite is non-flammable, but is decomposed by heat, light and acidic conditions. Pressure build up in containers could result in an explosion when heated or on contact with acidic fumes. Vigorous reaction with oxidizable organic materials may result in a fire.

Protective Clothing Protect firemen against corrosive fumes and liquids. Full protection equipment, including a self-contained breathing apparatus, should be worn.

6. Accidental release measures

Personal Precautions Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. Extinguish or remove all ignition sources and ventilate the area.

Wear adequate personal protective equipment.

Wear tightly fitted safety goggles. Where there is any possibility of splashing or spraying of this chemical wear a face shield/ chemical splash goggle combination, rubber apron, rubber boots and protective coveralls made of rubber, PVC or some other impervious material. Use a NIOSH approved canister type respirator suitable for chlorine. Full respiratory protection (including self-contained breathing apparatus) should be readily available in case of an emergency.

Environmental Precautions Harmful to aquatic life in low concentrations

Clean up Methods

Small Spills Contain the spill. Neutralize with sodium sulphite or sodium bisulphite. Mop up or soak up with adsorbent clay for disposal. Wash spill area with large volumes of water.

Dispose of residue in accordance with Local and State regulations.

Large Spills

Do not touch spilled material. Do not allow the spilled product to enter drains, sewers or surface waters. Contain spill with earth, sand, ash or other inert absorbent material for recovery and disposal. Never use combustibles such as sawdust to absorb and contain a leak or spill. For recovery, pump into polyethylene containers.

Place contaminated product and materials used in cleaning up spills or leaks in polythene containers for disposal at an approved site. Consult appropriate state and local regulatory agencies to ascertain proper disposal procedures.

Flush spill site with a large volume of water and allow to drain into a waste treatment system.

7. Handling and storage

Suitable Materials Store in rubber lined, suitable GFRP or suitable plastic tanks

Unsuitable Materials Metals such as iron, nickel, copper, tin and manganese

Handling/Storage Precautions Store in a closed container in a cool, dry well-ventilated area away from direct sunlight, and oxidizable material. Vented containers must be used. Keep storage temperatures below 29°C. Long storage is impossible due to the limited shelf life of sodium hypochlorite

8. Exposure Controls / personal precaution

Occupational Exposure Standards

Ingredient name	Exposure limits – OHS Act South Africa 1993
Chlorine	0.5 TWA OEL-RL ppm
1	Short Term OEL-RL ppm

Engineering Control Measures Local exhaust ventilation is preferred to maintain concentrations in air below applicable exposure limits. Special ventilation is required if sodium hypochlorite is exposed to decomposition conditions such as spills, or acidic conditions.

Safety showers and eye wash fountains should be installed in storage and handling areas.

Personal Protection – Respiratory Use NIOSH approved canister type respirators suitable for chlorine.

Full respiratory protection (including self-contained breathing apparatus) should be readily available in case of an emergency.

Personal Protection – Hand Wear rubber or other impermeable gloves

Personal Protection – Eye Wear tight fitted chemical goggles. Where there is any possibility of splashing or spraying of this chemical wear a face shield/ chemical splash goggle combination

Personal Protection – Skin Wear rubber apron, rubber boots and protective coveralls made of rubber, PVC or some other

impervious material.

Other Protection A safety shower and eye wash facility should be nearly and ready to use.

9. Physical and chemical properties

Appearance	Clear, light-yellow liquid
Odour	Strong Chlorine odour
pH	-12
Boiling Point/ Range	-25°C
Freezing point	-25°C
Flash point	Not applicable
Flammability	Not flammable
Auto flammability	Not Flammable
Auto Flammability	Not applicable
Explosive properties	
Oxidising Properties	Strong oxidising agent
Vapour pressure	17.5 mm Hg at 20°C
Density	min 1.20g/cm_3 at 20°C
Solubility – Water	100% m/m
Solubility – Solvent	

10. Stability and reactivity

Conditions to avoid Decomposes slowly. Do not expose to temperatures above 29°C, sunlight, or metals

Incompatible Materials Acids, oxidizable materials, ammonia, rea, other nitrogenous materials, and metals such as nickel, copper, tin, manganese, and iron.

Hazardous Decomposition products Chlorine gas is released by contact with acids, oxygen is released by contact with metals =. Contact with ammonia and urea produce nitrogen gas and chloramines, contact with oxidizable material produces heat which may generate chlorine gas.

11. Toxicological information

Acute Toxicity No human oral toxicity data available

AIHA recommends a time weighted average of 2mg/m_3 for 15 minutes exposure to sodium hypochlorite, under some circumstances, the exposure limits for chlorine may be applicable

Animal Toxicity Data

LD50 (oral, rat):	8910mg/kg
LC50	(1-hour, rat): 10500mg/m_3

Skin and Eye contact Highly corrosive solution

Causes sever irritation of the mucous membranes of the eyes. May cause permanent damage if no treated promptly.

Cause severe skin irritation with blistering and ulceration. May cause temporary or permanent damage if not treated properly

Sub-Chronic Toxicity Dermatitis, itchy eczema may result from frequent exposure. If overexposed to the solution, there will be constant irritation of the eyes, nose and throat

Carcinogenicity Not classified as carcinogenic by IARC and ACGIH

Mutagenicity No information available

Reproductive Toxicity No data available

Teratogenicity No information available

12. Ecological information

Aquatic Toxicity – Fish	Harmful to fish at low concentrations
Aquatic Toxicity – Daphnia	No data available
Aquatic Toxicity – Algae	Harmful to algae at low concentrations
Biodegradability	Is not biodegradable
Bioaccumulation	Does not bio-accumulate
Mobility	No data available

13. Disposal consideration

Disposal Methods

Dispose according to municipal, provincial and local regulations care should be taken not to mix waste with incompatible material

Disposal of Packaging Empty containers can contain harmful residues and are subject to proper waste disposal Always obey hazard warnings

14. Transport information

UN No	1791
Substance Identity NO	1791
ADR/RID Class	8
ADR/RID Item No	Not available
ADR/RID Hazard Identity No	85
IMDG – shipping name	Sodium Hypochlorite Solution
IMDG- class	Class 8 Corrosive (9.2)
IMDG- packaging group	III
IMDG- marine pollutant	Hazardous to the environment
IMDG – ems no	Not available
IMDG- MFAG Table No	Not available
IATA – Shipping Name	Sodium Hypochlorite Solution
IATA – Class	8
IATA- Subsidiary risk(s)	Corrosive, packaging Group III
ADNR – Class	Not available
UK – Description	Not available
UK – Emergency Action Code	Not available
UK – Classification	Not available

TREMCARD No.

15. Regulatory information

EEC Classification	(C;R31) Corrosive, contact with acids liberates toxic gas
Risk Phrases	R31-34 Contact with acids liberate toxic gas. Causes burns
R36	Irritating to eyes
R38	Irritating to skin

Safety phrases	S(1/2-) 28-45-50 Keep locked up out of the reach of children. After contact with skin, wash immediately with plenty of water. In case of accident or if you feel unwell, seek medical advice immediately (show label where possible) Do not mix with acids
National Legislation	Hazardous Substances Act 15 of 1973 and regulations Occupational Health and Safety Act 85 of 1993

16. Other Information

CAS No	7681-52-9
EINECS No	231-668-3
EEC ANNEX No	Not Available
MITI	Not Available

Exclusions of Liability All information and instructions provided in this Material Safety Data Sheet (MSDS) in respect of the substance is given solely in terms of the provisions of the Occupational Health and Safety Act No 85 of 1993 and Regulations (the Act) is based on scientific and technical knowledge as at the date indicated on this MSDS and is presented in good faith to be correct. The information and instructions provided in this MSDS apply only to the substance in its present from and not to any formulation or mix, in which event it is the sole responsibility of the user of the substance as formulated and/or mixed to investigate and establish any danger which may arise out of its use., wherever such user may be situated.

It is the sole responsibility of the person in receipt of this MSDS, wherever such recipient may be situated, to ensure that the information provided is communicated to and understand by any person who may come in contact with the substance in any place and in any manner whatsoever. If such recipient produces formulations or mixes using the substance, then it is such recipient's sole responsibility to comply with any other applicable legislation.