Material Safety Data Sheets

Revision 2

1. IDENTIFICATION

Product Name	**Sodium Hypochlorite Solution**
Other Names	**Clorox; HypochloriteSolution; Hypochlorous acid-sodium salt; Mixture - All components listed on AICS**
Uses	**Industrial user: Sanitising processing equipment.** **Textile industry: Bleaching agent.** **Water treatment: Sanitising agent.** **Available chlorine = 6 - 13%.**
Chemical Family	**No Data Available**
Chemical Formula	**NaOCl**
Chemical Name	**Sodium Hypochlorite Solution**
Company	**Arman sina.co**
Contact Information	**info@armansina.com** **www.armansina.com**

2. HAZARD IDENTIFICATION

Hazard Categories corrosive

Signal word danger

Hazard statements

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statements

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.
P390	Absorb spillage to prevent material damage.
P391	Collect spillage.
P501	Dispose of contents/container to industrial combustion plant.

Symbol

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Water	H_2O	7732-18-5	>60 %
Sodium Hypochlorite	ClHO.Na	7681-52-9	≤15 %
Sodium Hydroxide	HNaO	1310-73-2	<1 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	Rinse mouth with water. Give plenty of water to drink provided victim is conscious. Never give anything by mouth to an unconscious person. 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. Take care not to rinse contaminated water into the non-affected eye. Seek immediate medical attention.
Skin	If skin or hair contact occurs, immediately remove any contaminated clothing and flush skin and hair with running water. If redness, swelling, blistering or irritation occurs, seek medical advice. For skin burns, flood burnt area with plenty of water and cover with a clean, dry dressing. Seek immediate medical attention.
Inhaled	Remove victim from exposure to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth to mouth method. Induce artificial respiration with the aid of a pocket mask equipped with a one way valve or other proper respiratory medical device. Seek medical attention immediately.
Advice to Doctor	Treat symptomatically based on judgement of doctor and individual reactions of patient.
Medical Conditions Aggravated by Exposure	No information available on medical conditions aggravated by exposure to this product.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, remove containers from the path of fire.
Flammability Conditions	Product is a non-flammable liquid.
Extinguishing Media	Not combustible, however, if material is involved in a fire use: Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).
Fire and Explosion Hazard	Not considered to be a fire hazard. Sodium hypochlorite itself does not burn, but poisonous gases are produced in fire. The sodium hypochlorite anhydrous is very explosive. The product contact with combustible materials can cause fire.
Hazardous Products of Combustion	Emits toxic fumes of chlorine (hypochlorous acid and sodium chlorate) when heated to decomposition. The decomposition is an exothermal process.
Special Fire Fighting Instructions	Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.
Personal Protective Equipment	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) or chemical splash suit. Please note: Structural fire fighters uniform will provide limited protection.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	2X

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Shut off all possible sources of ignition. Avoid accidents, clean up immediately. Increase ventilation. Avoid walking through spilled product as it is slippery when spilt. Use clean, non-sparking tools and equipment.
Clean Up Procedures	Contain and recover liquid when possible. Small spills will be absorbed by covering with incombustible absorbents (earth, clay, sand). Large spills will be removing with vacuum trucks pump to storage vessels. Soak up residues with an absorbent such as clay, sand or other suitable material; place in a chemical waste containers for proper disposal. Neutralize with sodium sulphite, bisulfite or thiosulfate, and then flush with plenty of water. For small spills, take up with an absorbent material and place in a chemical waste containers; seal tightly for proper disposal.
Containment	Stop leak if safe to do so.
Decontamination	Special precautions: Do not use combustible materials, such as saw dust! Do not use sulphates or bisulphates for spill neutralizing!

Environmental Precautionary Measures	**Do not allow product to reach drains, sewers or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Authority.**
Evacuation Criteria	**Evacuate all unnecessary personnel.**

7. HANDLING AND STORAGE

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 against static discharges by bonding and grounding equipment. Avoid contact with eyes, skin and clothing. Do not inhale product vapours. Avoid prolonged or repeated exposure. Remove contaminated clothing and wash before reuse. Discard contaminated shoes. Keep away from combustible material. Empty containers pose a fire risk, evaporate residue under a fume hood. Chemicals should be used only by those trained in handling potentially hazardous materials. The electrical equipment has to be corrosion-preventing.**
Storage	**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. The aqueous solutions are sensitive to storage due the oxygen action Avoid the storage for long period because the product degrades over time. The recommended storing temperature is 15-250 Deg C. The storage at 150 Deg C reduces the rate of decomposition. This product has a UN classification of 1791 and a Dangerous Goods Class 8 (Corrosive) according to The Australian Code for the Transport of Dangerous goods By Road and Rail.**
Container	**Container type/packaging must comply with all applicable local legislation. Store in original packaging as approved by manufacturer.** **Materials used for storage tanks:** **Polyethylene: 5-7 years life time. The outdoor tanks will be UV proof.** **Glass fibre reinforced plastics designed accordingly** **chlorotrifluoroetylene) ; 3-6 years life time function of quality of lining application.** **Titanium the best material used for tank construction but because the high price is used only for specific applications.**

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	**The following exposure standard has been established by The Australian Safety and Compensation Council (ASCC); However, the following exposure standard does exist for decomposition product : Chlorine: Peak Limitation = 3 mg/m3 (1 ppm), Sodium hydroxide: Peak Limitation = 2 mg/m3** **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 is 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.**
Exposure Limits	**No Data Available**
Biological Limits	**No information available on biological limit values for this product.**
Engineering Measures	**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.**
Personal Protection Equipment	**RESPIRATOR: Self-contained breathing apparatus with full face-piece operated in the pressure demand. For emergencies or instances where exposure levels are not known, use a full face piece positive pressure, air supplied respirator. Warning! Air -purifying respirators do not protect workers in oxygen deficient atmospheres (AS1715/1716).** **EYES: Chemical splash goggles and/or face shield must be worn when possibility exist for eye contact due to splashing or spraying liquid or vapor (AS1336/1337).** **HANDS: Wear PVC, rubber or neoprene gloves. Glove thickness has to be of minimum 1.2 mm. Do not use leather gloves (AS2161).** **CLOTHING: Wear impervious protective clothing including boots, lab coat, apron or coveralls and safety footwear (AS3765/2210).**
Work Hygienic Practices	**Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.x**

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	**Liquid**
Appearance	**Liquid**
Odour	**Chlorine**

Colour	**Pale yellow - Green**
pH	**12.5 1% W/W**
Vapour Pressure	**25ºC**
Relative Vapour Density	**No Data Available**
Boiling Point	**96-99ºC**
Melting Point	**-16ºC**
Freezing Point	**No Data Available**
Solubility	**Miscible in water**
Specific Gravity	**1.2**
Flash Point	**No Data Available**
Auto Ignition Temp	**No Data Available**
Evaporation Rate	**No Data Available**
Bulk Density	**No Data Available**
Corrosion Rate	**No Data Available**
Decomposition Temperature	**No Data Available**
Density	**No Data Available**
Specific Heat	**No Data Available**
Molecular Weight	**No Data Available**
Net Propellant Weight	**No Data Available**
Octanol Water Coefficient	**No Data Available**
Particle Size	**No Data Available**
Partition Coefficient	**No Data Available**
Saturated Vapour Concentration	**No Data Available**
Vapour Temperature	**No Data Available**
Viscosity	**No Data Available**
Volatile Percent	**No Data Available**
VOC Volume	**No Data Available**
Additional Characteristics	**Specific density (water=1) 1.09 for 5.25%; 1.15 for 8.0%; 1.21for 12.0% Sodium hypochlorite solution is an aqueous mix of inorganic salts; therefore by heating of solution, water evaporates. At temperatures above 60C, the water evaporates with depositing of white crystals on the bottom of tank .For this reason the boiling point can not be determined**
Potential for Dust Explosion	**Product is a liquid.**
Fast or Intensely Burning Characteristics	**No Data Available**
Flame Propagation or Burning Rate of Solid Materials	**No Data Available**
Non-Flammables That Could Contribute Unusual Hazards to a Fire	**No Data Available**
Properties That May Initiate or Contribute to Fire Intensity	**No Data Available**
Reactions That Release Gases or Vapours	**No Data Available**
Release of Invisible Flammable Vapours and Gases	**No Data Available**

10. STABILITY AND REACTIVITY

General Information	**Corrosive liquid.**
Chemical Stability	**Reacts violently with acids with chlorine releasing. Stability decreases with concentration, heat, light exposure, decrease in pH and contamination with heavy metals, such as nickel, cobalt, copper and iron. After 3 months storage, at 150C, the product concentration (12.5%) decreases with 2%. At pH<11, sodium hypochlorite is unstable , decomposes with chlorine released.**

Conditions to Avoid	Light, heat and incompatibles.
Materials to Avoid	Aluminum, brass, cellulose, steel, stainless steel, bronzes. Strong acids, strong oxidizers, heavy metals (which act as catalysts), reducing agents, ammonia and ammonium salts, ether, and many organic and inorganic chemicals such as paint, kerosene, paint thinners, shellac.
Hazardous Decomposition Products	Emits toxic fumes of chlorine (hypochlorous acid and sodium chlorate) when heated to decomposition. The decomposition is an exothermal process.
Hazardous Polymerisation	Sodium hypochlorite is extremely corrosive for aluminium, brass. Reacts with metals (nickel, cooper, tin) with oxygen release, with ammonia, urea, oxidisable substances, ammonium nitrate, ammonium oxalate, ammonium phosphate ,ammonium acetate , ammonium carbonate , cellulose and methanol.

11. TOXICOLOGICAL INFORMATION

General Information	Acute toxicity Oral Rat male LD50 = 1100 mg/kg bw (for sodium hypochlorite sol.. 12% free chlorine) Mouse male LD50, = 880 mg/kg bw (for sodium hypochlorite sol.. 12% free chlorine) Inhalation Dermal Other routes : intra-peritoneal Rat LD 50, (1h) > 10,7 mg/L air, causes abundant tearing Rabbit male/female LD 50, >20 g/kg bw. Causes serious skin irritation. Mouse LD= 240-250mg/kg bw Guinea pig LD: 63 mg/kg bw Repeated dose toxicity Oral NOAEL: 50 mg/kg bw/day Sodium hypochlorite solution is a mixture of different chlorine species , with variant concentration depending on pH values. In biological system with pH ranging between 6-8, the most abundant species are HOCl and ClO- ions at balance. ClO- ion is present at alkaline pH, while Cl2 is present at pH <4. Sodium hypochlorite reacts rapidly with the organic molecules and cellular components, forming organic chlorinated compounds which have their own toxicity (BIBRA 1990). There are not available data about the dermal or oral exposure. However, due to its polarity is estimated a very limited adsorption by skin, without causing of lesions. Due to the low value of vapour pressure, the inhalation exposure is very limited. Hypochlorous ions are physiologically present in the human body, being formed by the white cells during anti-inflammatory process (they have anti ??microbial action). Mutagenity No genetic toxicity effects Toxicity for reproduction NaOCl has no geno toxic potential, therefore no classification is required according to 67/548/EEC and 1272/2008/EC (CLP) requirements. Carcinogenicity No carcinogenic potential.
EyeIrritant	A severe eye irritant. Corrosive to eyes; contact can cause corneal burns. Contamination of eyes can result in permanent injury.
Ingestion	Swallowing can result in nausea, vomiting, diarrhoea, abdominal pain and chemical burns to the gastrointestinal tract.
Inhalation	Breathing in mists or aerosols may produce respiratory irritation. Delayed (up to 48 hours) fluid build up in the lungs may occur.
SkinIrritant	Contact with skin will result in severe irritation. Corrosive to skin - may cause skin burns.
Carcinogen Category	No Data Available

12. ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic Toxicity Tests demonstrate NOEC (7 days)= 0,0021 mg/L. Factor M=10. Short-term toxicity to invertebrates (molluscs, Daphnia magna, Ceriodaphnia dubia) - Fresh water: EC50/LC50 =0,141 mg/L - Marine water: EC50/LC50 =0.026 mg/L Long-term toxicity to invertebrates - Marine water: LC100 (36days) 0,005mg/L - NOEC for aquatic invertebrates = 0.007 mg/L Short-term toxicity to fish - Fresh water LC 50 =0,06 mg/l - Marine water LC 50= 0.032 mg/l Long-term toxicity to fish

	- Marine water: NOEC= 0,04 mg CPO/L Short-term toxicity to algae and aquatic plants: Not applicable , sodium hypochlorite decomposes rapidly . Long-term toxicity to algae and aquatic plants - Fresh water EC50/LC50=0,1 mg/l - Marine water EC10/LC10 or NOEC =0,02 mg/L PNEC (Predicted No Effect Concentration) PNEC fresh water = Minimum long-term aquatic toxicity/10 = 0.21 PNEC marine water = Minimum long-term aquatic toxicity /50 = 0.042 Toxicity to sediment micro-organisms There are not predicted exposures due the fact that sodium hypochlorite is destroyed quickly by oxy-reduction. Sodium hypochlorite can not exist in presence of organic carbon. PNEC=0 fresh water sediment / marine water sediment. Terrestrial toxicity Short/long -term toxicity to terrestrial invertebrates Substance is not absorbed in soil and is not persistent in soil. TD50<1 min, PEC/PNEC soil<1. Toxicity to soil micro-organisms Short/long term toxicity to plants Due the fact that PEC/PNEC for terrestrial toxicity is <1 and at contact with soil hypochlorite dissipates quickly (TD50 <1 min) there is not estimated short/long toxicity to plants. In accordance with column 2 of REACH Annexes IX and X, there is no need to further investigate the effects of the substance on plants. Long-term toxicity to birds EC10/LC10 or NOEC on long term : 200 mg/kg food
Persistence/Degradability	Biotic: The inorganic water can not be tested for biodegradability. Abiotic: Hypochlorite degrades quickly during the transport through sewage system. Photo-transforming (Photolysis) Atmospheric degradation: At medium pH (6, 5-8, 5) value, half of sodium hypochlorite is present as hypochlorous acid and the other half is dissociate as hypochlorite ions. In the atmosphere, hypochlorous acid degrades, generating atomic chlorine, which is destroyed by UV radiation. The half ??life is115 days. Does not react with ozone layer. Photolysis in water Half-life for sodium hypochlorite solution, active chlorine 12-15%, at 250C is 220 days. In presence of light, the halflife decreases 3-4 times. The UV radiation decomposes the hypochlorite, generating chlorate, chlorite and oxygen: 3 ClO- => ClO3- + 2 Cl- (1) 2 ClO- => 2 Cl- + O2 (2) In water, under photolysis, sodium hypochlorite with concentration of13-18 mg/L, has a half-life of 12 min. at pH =8 . This increases up to 60 min. with pH decreasing
Mobility	At medium pH (6,5-8,5) value, half of sodium hypochlorite is present as hypochlorous acid and the other half is dissociate as hypochlorite ions. The absorption of hypochlorous acid particles, the air volatilization and soil absorption are very low. Thus, hypochlorite remains in aqueous phase and degrades to chlorine.
Environmental Fate	Do NOT let product reach waterways, drains and sewers.
Bioaccumulation Potential	Hypochlorite reacts instantaneously with organic and oxidant materials. Has not potential for bioaccumulation. PBT/vPvB: Hypochlorite does not fulfil the PBT criteria (not PBT) and not the vPvB criteria (not vPvB).
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of in accordance with all local federal regulations. All empty packaging should be disposed of in accordance with Local Regulations or recycled/reconditioned at an approved facility. Waste packaging should be recycled. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.
Special Precautions for Land Fill	Contact a specialist disposal company or the local waste regulator for advice. Incineration or landfill should only be considered when recycling is not feasible.

14. TRANSPORT INFORMATION

Land Transport

Proper Shipping Name	HYPOCHLORITE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	154 Substances - Toxic and/or Corrosive (Non-Combustible)
UN Number	1791
Hazchem	2X

Pack Group	**III**
Special Provision	**No Data Available**

Sea Transport

Proper Shipping Name	**HYPOCHLORITE SOLUTION**
Class	**8 Corrosive Substances**
Subsidiary Risk(s)	**No Data Available**
UN Number	**1791**
Hazchem	**2X**
Pack Group	**III**
Special Provision	**No Data Available**
EMS	**FA,SB**
Marine Pollutant	**Yes**

Air Transport

Proper Shipping Name	**HYPOCHLORITE SOLUTION**
Class	**8 Corrosive Substances**
Subsidiary Risk(s)	**No Data Available**
UN Number	**1791**
Hazchem	**2X**
Pack Group	**III**

15. OTHER INFORMATION

Revision	**2**
Key/Legend	**< Less Than** **> Greater Than** **atm Atmosphere** **CAS Chemical Abstracts Service (Registry Number)** **cm Square Centimetres** **CO2 Carbon Dioxide** **COD Chemical Oxygen Demand** **Degrees Celcius** **Degrees Farenheit** **g Grams** **g/cm Grams per Cubic Centimetre** **g/l Grams per Litre** **HSNO Hazardous Substance and New Organism** **IDLH Immediately Dangerous to Life and Health** **immiscible Liquids are insoluable in each other.** **inHg Inch of Mercury** **inH2O Inch of Water** **K Kelvin** **kg Kilogram** **kg/m Kilograms per Cubic Metre** **lb Pound** **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 or L Litre** **m Cubic Metre** **mbar Millibar** **mg Milligram** **mg/24H Milligrams per 24 Hours** **mg/kg Milligrams per Kilogram** **mg/m Milligrams per Cubic Metre** **Misc or Miscible Liquids form one homogeneous liquid phase regardless of the amount of either component present.** **mm Millimetre** **mmH2O Millimetres of Water**

mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
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
wt Weight