Safety (MSDS) data for ammonium hydroxide

General

Synonyms: ammonia solution (typically contains between 12% and 44% ammonia before dilution), dilute ammonia, concentrated ammonia. [Data for ammonia gas, NH_3, is available here.]
Molecular formula: NH_4OH
CAS No: 1336-21-6
EC No: 215-647-6

Physical data

Appearance: colorless liquid
Melting point:
Boiling point:
Vapor density: 1.2
Vapor pressure: 115 mm at 20 C (depends on solution strength)
Specific gravity: typically 0.9 (depends on solution strength)
Flash point: none
Explosion limits: 16 - 27%
Autoignition temperature: 651 C

Stability

Stable. Incompatible with copper, copper alloys, acids, galvanized iron, zinc, aluminum, bronze, dimethyl sulphate, mercury, and alkali metals.

Toxicology

Concentrated solution is extremely damaging to eyes. Even contact with dilute ammonia solution can lead to serious eye damage. Toxic if swallowed; harmful if inhaled and in contact with skin. Very destructive of mucous membranes. Corrosive - causes burns. Typical TLV 25 ppm. Typical STEL 35 ppm. Typical PEL 50 ppm.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given here.)
ORL-RAT LD50 350 mg kg^{-1}

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R20 R21 R22 R34 R36 R37 R38 R41.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 2672. Hazard class: 8.0. Packing group: III.

Personal protection

Good quality safety glasses with side protection against splashes. Good ventilation. Do not work in the open laboratory with concentrated ammonium hydroxide solution.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)
S7 S26 S45.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

This information was last updated on August 24, 2005.

Material Safety Data Sheet

Revision Issued: 9/24/2008 Supercedes: 9/09/2007 First Issued: 6/17/87

Section I - Chemical Product And Company Identification

Product Name: Sodium Hypochlorite

CAS Number: 7681-52-9 HBCC MSDS No. CC17000

HILL BROTHERS Chemical Co.
1675 NORTH MAIN STREET • ORANGE, CALIFORNIA 92867-3400
(714) 998-8800 • FAX: (714) 998-8310
http://hillbrothers.com

1675 No. Main Street, Orange, California 92867
Telephone No: 714-998-8800 | Chemtrec: 800-424-9300

Section II - Composition/Information On Ingredients

			Exposure Limits (TWAs) in Air		
Chemical Name	CAS Number	%	ACGIH TLV	OSHA PEL	STEL
Sodium Hypochlorite	7681-52-9	5-15	N/A	N/A	2mg/m³
Sodium Hydroxide	1310-73-2	< 1	N/A	N/A	2mg/m³

Section III - Hazard Identification

Routes of Exposure: Sodium hypochlorite may affect the body either through ingestion, inhalation, or contact with the eyes and/or skin.

Summary of Acute Health Hazards

Ingestion: May cause irritation of the membranes of the mouth and throat, stomach pain, and possible ulceration.

Inhalation: May cause burns, cough, pulmonary edema, up to 48 hours after exposure.

Skin: May cause moderate skin irritation and reddening of the skin. Prolonged exposure may cause burns, blistering.

Eyes: May cause severe irritation such as burns, and eye damage.

Summary of Chronic Health Hazards: Irritating effects increase with strength of solution and time of exposure.

Medical Conditions Generally Aggravated by Exposure: N/A

Note to Physician: The absence of visible signs of burns does NOT reliably exclude the presence of actual tissue damage.

Section IV - First Aid Measures

Ingestion: Do not give any liquid to an unconscious person. Drink large quantities of gelatin solution if able to swallow. If these are not available, drink large quantities of water. DO NOT give vinegar, baking soda or acidic antidotes. Do not induce vomiting unless directed by a Poison Control Center or Medical Doctor. GET MEDICAL ATTENTION IMMEDIATELY.

Inhalation: If adverse effects occur, remove to fresh air. Give artificial respiration if

not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. If respiration or pulse has stopped, call 911 or an ambulance, have a trained person administer Basic Life Support, Cardio-Pulmonary Resuscitation (CPR) / Automatic External Defribillator (AED), and GET MEDICAL ATTENTION IMMEDIATELY.

Skin: Immediately flush contaminated areas with plenty of water for 15 to 20 minutes. Remove contaminated clothing, jewelry, and shoes immediately. Wash contaminated areas with soap and water. Thoroughly clean and dry contaminated clothing and shoes before reuse. GET MEDICAL ATTENTION IMMEDIATELY.

Eyes: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. GET MEDICAL ATTENTION IMMEDIATELY. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Contact lenses should not be worn when working with this chemical.

Section V - Fire Fighting Measures

Flash Point: Nonflammable **Autoignition Temperature:** N/A

Lower Explosive Limit: N/A **Upper Explosive Limit:** N/A

Unusual Fire and Explosion Hazards: Heat and acid contamination will produce irritating and toxic fumes. May decompose, generating irritating chlorine gas.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire.

Special Firefighting Procedures: Wear NIOSH approved positive-pressure self-contained breathing apparatus. Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Section VI - Accidental Release Measures

[Spills may need to be reported to the National Response Center (800/424-8802) DOT Reportable Quantity (RQ) is 100 pounds Ventilate the area of the spill or leak. For large spills, evacuate the hazard area of unprotected personnel. Wear appropriate protective clothing. Dike and contain. Neutralize with sodium sulfite, bisulfite or thiosulfite. Remove with vacuum trucks or pump to storage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material; place in non-leaking containers for proper disposal. Flush area with water to remove trace residue; dispose of flush solutions as above. For small spills, take up with an absorbent material and place in non-leaking containers; seal tightly for proper disposal. This material is alkaline and may raise the pH of surface waters with low buffering capacity.

Section VII - Handling and Storage

Store in vented, closed, clean non-corrosive containers in a cool, dry location away from direct sunlight and heat to avoid deterioration. Do not store adjacent to chemicals which may react with the bleach if spillage occurs. If closed containers become heated, the containers should be vented to release decomposition products (mainly oxygen under normal decomposition). Do not mix or contaminate with ammonia, hydrocarbons, acids, alcohols or ethers.

Section VIII - Exposure Controls/Personal Protection

Respiratory Protection: Not required under normal use conditions. In the case of a fire use self-contained breathing apparatus. A NIOSH approved respirator with N95

(dust, fume, mist) filters may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure.
When decomposition products exist, acid gas cartridges are also required.
A half-piece air-purifying respirator may be used in concentrations up to 10X the acceptable exposure level and a full facepiece air-purifying respirator may be used in concentrations up to 50X the acceptable exposure level.
Supplied air should be used when the level is expected to above 50X the acceptable level, or when there is a potential for uncontrolled release.
A respiratory program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.
Ventilation: No special ventilation is required unless bleach is exposed to decomposition conditions, i.e. heat or acidic conditions.
Protective Clothing: Avoid contact with the eyes. Wear chemical goggles and/or face shield if there is the likelihood of contact with the eyes. Avoid prolonged or repeated contact with the skin. Wear chemical-resistant gloves and other clothing as required to minimize contact.
Other Protective Clothing or Equipment: Safety showers and eyewash fountains should be available in storage and handling areas.
Work/Hygienic Practices: Wash hands thoroughly with soap and water before eating, drinking, smoking or using toilet facilities. Do NOT place food, coffee or other drinks in the area where dusting or splashing of solutions is possible.

Section IX - Physical and Chemical Properties

Physical State: Liquid

pH: 12

Freezing/Melting Point/Range: -5 to -25°C

Boiling Point/Range: 40-76°C (104-169°F) (Decomposes)

Appearance/Color/Odor: Colorless to pale yellow watery liquid with a pungent chlorine odor

Solubility in Water: 100%

Vapor Pressure(mmHg): 12-17 @ 20°C

Specific Gravity(Water=1): 1.07-1.26 @ 20°C

Molecular Weight: 75.45

Vapor Density(Air=1): 2.61

% Volatiles (by volume): Variable-Water plus products of Decomposition

How to detect this compound :
N/A

Section X - Stability and Reactivity

Stability: Unstable above 40°C, in sunlight, or in contact with acid.

Hazardous Polymerization: Will Not Occur

Conditions to Avoid: Stability decreases with concentration, heat, light exposure, decrease in pH and contamination with heavy metals, such as nickel, cobalt, copper and iron.

Materials to Avoid: Strong acids, oxidizable materials, heavy metals (which act as catalysts), reducing agents, ammonia solutions, ether, and many organic and inorganic chemicals such as paint, kerosene, paint thinners, shellac, grease and oils.

Hazardous Decomposition Products: Chlorine. Additional decomposition products which depend upon pH, temperature and time are sodium chloride, sodium chlorate and oxygen.

Section XI - Toxicological Information

Toxicity Data: By ingestion, Grade 1: oral rat LD_{50} = 8.91 g/kg IDLH Value: Data not available

Section XII - Ecological Information

This material may be harmful to aquatic life in low concentrations.

Section XIII - Disposal Considerations

Do not contaminate food or feed by storage, disposal or cleaning of equipment. Product or rinsates that cannot be used should be diluted with water before disposal in a sanitary sewer. Can be neutralized with weak reducing agents such as sodium sulfite, bisulfite, or thiosulfite (DO NOT USE SULFATES OR BISULFATES). Dispose of in accordance with all applicable local, county, state and federal regulations.

Section XIV - Transport Information

DOT Proper Shipping Name: Hypochlorite Solutions
DOT Hazard Class/ I.D. No.: 8, UN1791, III

Section XV - Regulatory Information

Reportable Quantity: 100 Pounds (45.4 Kilograms)
NFPA Rating: Health - 2; Flammability - 0; Instability - 1
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme
Carcinogenicity Lists: No **NTP:** No **IARC Monograph:** No **OSHA Regulated:** No

Certified to NSF/ANSI Standard 60 12.5% Solution Maximum Use 84 mg/L

Under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act, sodium hypochlorite (bleach) is registered for use as an antimicrobial pesticide, a sanitizer or disinfectant to kill bacteria, funqi, and viruses.

Section XVI - Other Information

Hazardous Ingredients: Sodium hypochlorite is manufactured only in solution form. Industrial grade sodium hypochlorite contains from 10 - 15% by weight NaOCL (10 - 17.8% available chlorine) with about 0.50-1.00% excess NaOH for stability control.
Synonyms/Common Names: Liquid Bleach
Chemical Family/Type: Halogen Compound
Sections changed since last revision: III, IV, VII, XIII, XV

IMPORTANT! Read this MSDS before use or disposal of this product. Pass along the information to employees and any other persons who could be exposed to the product to be sure that they are aware of the information before use or other exposure. This MSDS has been prepared according to the OSHA Hazard Communication Standard [29 CFR 1910.1200]. The MSDS information is based on sources believed to be reliable. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, **Hill Brothers Chemical Company** makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Also, additional information may be necessary or helpful for specific conditions and circumstances of use. It is the user's responsibility to determine the suitability of this product and to evaluate risks prior to use, and then to exercise appropriate precautions for protection of employees and others.