

UNIROYAL

Material Safety Data Sheet

Uniroyal Chemical Company, Inc.
World Headquarters
Middlebury, CT 06749

UNIROYAL Emergency Phone: (203) 723-3670
CHEMTREC Transportation Emergency Phone: 1-800-424-9300
SAFETY DATA Information (203) 573-3303

MSDS No. C205001Date Issued: 7/26/85

IDENTIFICATION

Trade Name: AMINOX® ✓

CAS Number: 9003-79-6

Chemical Name: Diphenylamine-acetone
reaction product

Chemical Family: Aromatic Amine

SPECIAL REGULATORY HAZARDS

<u>Ingredient</u>	<u>CAS No.</u>	<u>Exposure Limit</u>	<u>OSHA (1910.1200)</u>	<u>EEC*</u>
Product	9003-79-6	ND	Not hazardous	Not hazardous

Hazard assessment based on available data.

Transportation: NA

PHYSICAL DATA

Appearance and Odor: Greenish-brown powder; characteristic odor

Solubility: Insoluble in water

Soluble in benzene & acetone

Melting Point: 185°F (85°C)

Boiling Point: NA

Other Data: NA

Specific Gravity (H₂O = 1): 1.16

Vapor Pressure @ 20°C: ND

Vapor Density (Air = 1): ND

Volatility @ 70°F: Low

FIRE AND EXPLOSION HAZARD DATA

Flash Point: 355°F (179.4°C) TCC

Autoignition Temp: ND

Extinguishing Media: Water spray, dry chemical

Flammable Limits: ND

Special Fire Fighting Procedures: Protect against inhalation of combustion products.

Unusual Hazards: May form explosive dust-air mixtures.

REACTIVITY DATA

Stability: Stable at ambient temperatures and pressures.

Incompatibility: Strong oxidizing agents.

Decomposition Products: Oxides of carbon and nitrogen under burning conditions

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NA = Not Applicable

ND = Not Determined

*European Economic Community

Uniroyal makes no representation or warranty with respect to the information in this Material Safety Data Sheet. The information is however, as of this date provided, true and accurate to the best of Uniroyal's knowledge. This list of information is not intended to be all inclusive. Actual conditions of use and handling may require considerations of information other than, or in addition to, that which is provided herein.

SPECIAL PROTECTION INFORMATION

Engineering Controls: Sufficient ventilation to minimize vapor exposure. Avoid accumulation of dust on surfaces of building and equipment.

Personal Protection Equipment: Avoid all personal contact. Observe good personal hygiene. Impervious gloves and goggles should be worn when handling. In the absence of adequate ventilation, use NIOSH-approved dust cartridge respirator.

STORAGE, SPILLS AND DISPOSAL INFORMATION

Storage: Store away from sources of direct heat in a dry area. Keep containers closed when not in use.

Spills: Sweep or vacuum up. Shovel into secure containers for proper disposal. Avoid creating dust. Use personal protective equipment as outlined above.

Disposal: In accordance with any applicable local, state, federal regulation regarding organic waste.

Environmental Information: Environmental effects have not been determined.

HEALTH RELATED DATA

Specific Hazard(s): No health hazards have been identified.

Primary Route(s) of Entry: Inhalation and skin absorption.

First Aid Procedures: **Eye contact:** Flush with water for 15 minutes.

Skin contact: Wash thoroughly with soap and water

Inhalation: Remove to fresh air.

Toxicology Information: **Oral toxicity:** LD50 (rats) - > 5 g/kg

Irritation: eye (rabbits) - negative

skin (rabbits) - negative

No history of any significant adverse effects noted with long-term production and use of this material.

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OxyChem®

MATERIAL SAFETY DATA SHEET

MSDS NUMBER : M8363

MSDS DATE : 10-02-91

PRODUCT NAME : AMMONIA, ANHYDROUS

24 HOUR EMERGENCY PHONE: (716) 278-7021

I. PRODUCT IDENTIFICATION

HMIS HAZARD RATINGS

HEALTH HAZARD 3* FIRE HAZARD 1 REACTIVITY 1
Based on the National Paint & Coatings Association HMIS rating system.

SARA/TITLE III HAZARD CATEGORIES (See Section X)

Immediate (ACUTE) Health: YES Reactive Hazard: NO
Delayed (Chronic) Health: YES Sudden Release of Pressure: YES
Fire Hazard: NO

MANUFACTURER'S: Occidental Chemical Corporation, Agricultural
NAME AND : Products, 4830 West Kennedy Blvd, Suite 950
ADDRESS : Tampa, Florida 33609 (Telephone 813-286-3800)

CHEMICAL NAME: Ammonia CAS NUMBER: 7664-41-7

SYNONYMS/COMMON NAMES: Ammonia Gas, Anhydrous Ammonia

CHEMICAL FORMULA: NH₃

DOT PROPER SHIPPING NAME: Ammonia, Anhydrous

DOT HAZARD CLASS: 2.2

DOT I.D. NUMBER: UN1005

DOT HAZARDOUS SUBSTANCE: RQ 100#

ADDITIONAL/DESCRIPTION REQUIREMENT: Inhalation hazard

II. HEALTH HAZARD INFORMATION

EMERGENCY AND FIRST AID PROCEDURES

EYES:

OBJECT IS TO FLUSH MATERIAL OUT IMMEDIATELY AND THEN SEEK MEDICAL ATTENTION. IMMEDIATELY flush eyes with a directed stream of water for at least 15 minutes while forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Washing eyes within one (1) minute is essential to achieve maximum effectiveness. SEEK MEDICAL ATTENTION IMMEDIATELY.

CAS = Chemical Abstract Service Number ND = No relevant information found or not available
PEL = OSHA Permissible Exposure Limit CORP = Corporate Exposure Limit
TLV = ACGIH Threshold Limit Value, Current = See Chronic Effects Information NA = Not applicable

IMPORTANT: The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY, OR GUARANTY, EXPRESS OR IMPLIED IS MADE REGARDING PERFORMANCE, STABILITY, OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling and storage. Other factors may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as a recommendation to infringe any existing patents or violate any Federal, State or local laws.

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II. HEALTH HAZARD INFORMATION (Continued)

SKIN:

IMMEDIATELY flush contaminated skin with water and wash with soap and water. If clothing is penetrated, IMMEDIATELY use safety shower - remove clothing and flush skin with copious amounts of water for at least 15 minutes. GET PROMPT MEDICAL ATTENTION. Wash clothing before reuse.

INHALATION:

Move exposed person to fresh air at once. Keep affected person warm and at rest. If breathing is difficult, have trained person administer oxygen. If breathing has stopped, perform mouth-to-mouth resuscitation. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION:

Unlikely to occur. If victim is conscious, administer large quantities of water IMMEDIATELY. Do not induce vomiting. GET IMMEDIATE MEDICAL ATTENTION.

ROUTES OF EXPOSURE

INHALATION:

Irritation of upper respiratory tract occurs at concentrations above 140 ppm. Ammonia fumes may cause severe breathing difficulties which may be delayed in onset.

SKIN:

Severe irritant. Contact with liquid ammonia may produce severe burns of the skin.

EYE CONTACT:

Aqueous Ammonia rapidly penetrates ocular tissue and may cause permanent damage. Exposure to high concentrations may cause temporary blindness. Contact with liquid ammonia may cause severe eye burns.

INGESTION:

Not a likely route of exposure.

EFFECTS OF OVEREXPOSURE

ACUTE:

Severely irritating to skin, eyes, respiratory and digestive tracts. Contact with liquid may cause severe burns and irreversible damage.

CHRONIC:

Prolonged inhalation of ammonia at concentrations above the PEL may cause bronchitis and/or pneumonia, with residual reduction in pulmonary function.

TOXICOLOGY DATA:

Acute Inhalation LC50	(mouse)	4230 ppm(2945 mg/m3)1hr
Acute inhalation LC50	(rat)	2000 ppm(1400 mg/m3)4hr

Inhalation of concentrations of 1750-4600 mg/m3 (2430-6390 ppm) causes shortness of breath, bronchospasm, chest pain and pulmonary edema which may be fatal. Maximum tolerable concentration in one hour is between 210-350 mg/m3 (290-485 ppm). Prolonged and repeated exposure to very high concentrations (eg: 165ppm) may also result in kidney damage.

Subchronic (42-day) inhalation toxicity studies were performed in rats, guinea pigs, rabbits, dogs and monkeys. Animals were exposed for 8hr/day, 5 days/week over a dose range of 165-611 ppm. At the low dose, nonspecific changes were observed in lungs and kidneys. At the high dose (611ppm) all animals developed pneumonitis and many had kidney damage. In a second subchronic inhalation study with rats and mice, 500 ppm ammonia induced increases in the weights of the lungs and kidneys plus signs of upper respiratory tract irritation.

III. IMPORTANT COMPONENTS

CAS NUMBER / NAME

7664417 Ammonia

EXPOSURE LIMITS

STEL=35 ppm; 27 mg/m3
TLV=25 ppm; 17 mg/m3
STEL=35 ppm; 24 mg/m3

PERCENTAGE

VOL 99.70
WT 99.70

COMMON NAMES:

ANHYDROUS AMMONIA

Listed On(List Legend Below):

01 02 13 18 21

See Section II

All components of this product that are required to be on the TSCA Inventory are listed on the inventory.

Not listed as carcinogen - IARC, NTP, OSHA

LIST LEGEND

1 SARA EXTR HAZ SUB, SECTION 302	2 SARA TOXIC CHEM, SECTION 313
13 PA ENVIRONMENTAL HAZ SUBSTANCE	18 NY HAZARDOUS SUBSTANCES
21 NJ SPECIAL HEALTH HAZ SUB	

IV. FIRE AND EXPLOSION DATA

FLASH POINT: NA AUTOIGNITION TEMPERATURE: 651°C (1204°F)

FLAMMABLE LIMITS IN AIR, % BY VOLUME- UPPER: 27
LOWER: 16

EXTINGUISHING MEDIA:

Use water spray, fog, foam, dry chemicals, CO2, or other agents as appropriate for materials in the fire.

SPECIAL FIRE FIGHTING PROCEDURES:

Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus and full protective equipment. Evacuate area if tanks are leaking or heavily exposed to heat.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Excessive heat will form nitrogen oxides.

V. SPECIAL PROTECTION

VENTILATION REQUIREMENTS:

Provide good general room ventilation to minimize exposure. Use local exhaust ventilation at points of emission.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY:

Use NIOSH/MSHA approved ammonia vapor respirator for areas where airborne exposure is excessive.

EYE:

Wear safety glasses with side shields or chemical goggles.

GLOVES:

Wear protective gloves made of vinyl, neoprene or rubber to minimize skin contact. Wash thoroughly after handling.

OTHER CLOTHING AND EQUIPMENT:

Eye wash facility and emergency shower should be in close proximity. Use of chemical resistant clothing, face shield and rubber shoes are recommended.

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VI. PHYSICAL DATA

BOILING POINT @ 760 mm Hg: -33.3°C (-28°F)
MELTING POINT: -77.7°C
VAPOR PRESSURE: 5 ATM @ 4.4°C (40°F)
SPECIFIC GRAVITY (H₂O=1): 0.7 @ -33.3°C
SOLUBILITY IN H₂O % BY WT: 51 @ 20°C
VAPOR DENSITY (A_{ir}=1): 0.597 @ 80°C and 1 ATM
APPEARANCE AND ODOR: Colorless gas, pungent odor
pH: NA
% VOLATILE: 100

VII. REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY:

Avoid heat and ignition sources. Avoid storage with oxidizing gases, chlorine, bromine, iodine, and acids. May form explosive compounds on contact with silver, mercury or halogens. Reacts with copper, copper alloys, aluminum alloys and galvanized surfaces.

INCOMPATIBILITY:

Silver, mercury, halogens, copper, copper alloys, aluminum alloys and galvanized surfaces.

HAZARDOUS DECOMPOSITION PRODUCTS:

Products of decomposition include oxides of nitrogen.

VIII. HANDLING AND STORAGE

HANDLING AND STORAGE PRECAUTIONS:

Store in a cool, dry, well ventilated, fire-resistant area separate from acids and oxidizing gases, bleach and chlorates. Provide automatic monitoring system. Avoid copper, copper alloy, aluminum alloy or galvanized fittings. Wear protective equipment to prevent contact.

IX. ENVIRONMENTAL PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Keep unprotected people away. Stay upwind of source. Personnel involved in clean-up must wear full protective equipment and self-contained breathing apparatus. Use copious amounts of water spray to reduce concentration and vapor pressure. Contaminated area and equipment should be thoroughly washed down with water. Do not allow substance to enter sewers or streams.

WASTE DISPOSAL METHOD:

Dilute with water and drain to waste treatment facilities. Dispose of in accordance with federal, state and local regulations. Report spills of 100 pounds or more to the National Response Center, 1-800-424-8802.

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X. ADDITIONAL INFORMATION

Shipment regulated by US DOT. Classified as non-flammable material, requires a non-flammable DOT label, and is assigned UN # 1005. Designated hazardous substance by 29 CFR Sec 1910 Subpart Z by OSHA. Designated hazardous substance by ACGIH.

Sec 311 of Clean Water Act lists as hazardous which, if discharged to or upon water may require immediate response to mitigate danger to public. Spills of 100 pounds or more must be reported to the National Response Center 1-800-424-8802.

Listed under provisions of Sec 304 of The Clean Water Act which requires the EPA administrator to establish water quality criteria reflecting the latest scientific knowledge concerning specific pollutants. Listed on a composite list as required under Sec 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), usually referred to as Superfund.

OSHA Standard 29CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, material safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Material Safety Data Sheet available to your employees.

To aid our customers in complying with regulatory requirements, SARA Title III hazard categories for this product are indicated in Section I. If the word "YES" appears next to any category, this product may be reportable by you under the requirements of 40 CFR Part 370. Please consult those regulations for details.

This product contains a toxic chemical or chemicals subject to the reporting requirements of SECTION 313 of TITLE III of the SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 and 40 CFR PART 372. (See Section III, List Legend 02)

XI. PREPARATION INFORMATION

For additional Non-Emergency health, safety, or environmental information telephone (716) 286-3606, or write to:
Occidental Chemical Corporation
Product Stewardship Department
Suite 400
360 Rainbow Boulevard South
Niagara Falls, NY 14302

For Emergencies: 24 HOUR EMERGENCY PHONE: (716) 278-7021

This MSDS replaces OCC MSDS dated 10/02/90.

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WARNING LABEL INFORMATION

Occidental Chemical Corporation
Agricultural Products Inc. 4830 West Kennedy Blvd.,
Suite 950, Tampa, Florida 33609 (Telephone 813-286-3800)

In case of CHEMICAL EMERGENCIES - Call (716) 278-7021 (24 hours)

CAS Number: 7664-41-7

SIGNAL WORD: DANGER

STATEMENT OF HAZARDS:

COMPRESSED LIQUIFIED GAS UNDER PRESSURE.
LIQUID CAUSES SEVERE BURNS TO EYES AND SKIN.
VAPOR EXTREMELY IRRITATING TO EYES, SKIN AND RESPIRATORY TRACT.
MAY BE FATAL IF INHALED OR INGESTED.
PROLONGED EXPOSURE MAY REDUCE PULMONARY FUNCTION.

PRECAUTIONARY STATEMENTS:

Do not breathe vapor.
Insure adequate ventilation or use NIOSH/MSHA approved respirator with ammonia cartridge.
Do not get in eyes, on skin or on clothing.
Use goggles, face shield and rubber boots.
Wear gloves and protective clothing made of vinyl, neoprene or rubber.
Keep away from heat, sparks and open flame.

FIRST AID:

IN CASE OF CONTACT:

FOR EYES:

OBJECT IS TO FLUSH MATERIAL OUT IMMEDIATELY AND THEN SEEK MEDICAL ATTENTION. IMMEDIATELY flush eyes with a directed stream of water for at least 15 minutes while forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Washing eyes within one (1) minute is essential to achieve maximum effectiveness. SEEK MEDICAL ATTENTION IMMEDIATELY.

FOR SKIN:

IMMEDIATELY flush contaminated skin with water and wash with soap and water. If clothing is penetrated, IMMEDIATELY use safety shower - remove clothing and flush skin with copious amounts of water for at least 15 minutes. GET PROMPT MEDICAL ATTENTION. Wash clothing before reuse.

IF INHALED:

Move exposed person to fresh air at once. Keep affected person warm and at rest. If breathing is difficult, have trained person administer oxygen. If breathing has stopped, perform mouth-to-mouth resuscitation. GET IMMEDIATE MEDICAL ATTENTION.

IF SWALLOWED:

Unlikely to occur. If victim is conscious, administer large quantities of water IMMEDIATELY. Do not induce vomiting. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF:

SPILL OR LEAK:

Wear full protective equipment and clothing
Use copious amounts of water spray to reduce concentration and vapor pressure.
Evacuate unprotected personnel in downwind areas
Keep contaminated water out of sewers and streams

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MSDS NUMBER: M8363
PRODUCT NAME: AMMONIA, ANHYDROUS

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WARNING LABEL INFORMATION (Continued)

FIRE:

Wear self-contained breathing apparatus and full protective clothing.
Use water spray, foam, dry chemicals, CO2 or other extinguishing medium as appropriate for surrounding fire.
Evacuate area if tanks are leaking or heavily exposed to heat.

HANDLING AND STORAGE:

Store in cool, dry, well ventilated area with automatic monitoring system.
Store separate from acids, oxidizing gases, bleach, chlorates and metals.

DISPOSAL:

Dilute with water and drain to waste treatment facilities.
Dispose of in accordance with federal, state and local regulations.
Report spills of 100 pounds or more to the National Response Center, 1-800-424-8802.

INFORMATION REQUIRED BY FEDERAL, STATE OR LOCAL REGULATIONS:

This product contains:

CAS#	NAME
7664417	Ammonia

HMIS RATING SYSTEM: HEALTH 3* FLAMMABILITY 1 REACTIVITY 1

FOR INDUSTRIAL USE ONLY LABEL 101M8363

For further information, Request OCC MSDS M8363

OxyChem®

MATERIAL SAFETY DATA SHEET

MSDS NUMBER : M8363

MSDS DATE : 10-02-91

PRODUCT NAME : AMMONIA, ANHYDROUS

24 HOUR EMERGENCY PHONE: (716) 278-7021

I. PRODUCT IDENTIFICATION

HMIS HAZARD RATINGS

HEALTH HAZARD 3* FIRE HAZARD 1 REACTIVITY 1
Based on the National Paint & Coatings Association HMIS rating system.

SARA/TITLE III HAZARD CATEGORIES (See Section X)

Immediate (ACUTE) Health: YES Reactive Hazard: NO
Delayed (Chronic) Health: YES Sudden Release of Pressure: YES
Fire Hazard: NO

MANUFACTURER'S: Occidental Chemical Corporation, Agricultural
NAME AND : Products, 4830 West Kennedy Blvd, Suite 950
ADDRESS : Tampa, Florida 33609 (Telephone 813-286-3800)

CHEMICAL NAME: Ammonia CAS NUMBER: 7664-41-7

SYNONYMS/COMMON NAMES: Ammonia Gas, Anhydrous Ammonia

CHEMICAL FORMULA: NH₃

DOT PROPER SHIPPING NAME: Ammonia, Anhydrous

DOT HAZARD CLASS: 2.2

DOT I.D. NUMBER: UN1005

DOT HAZARDOUS SUBSTANCE: RQ 100#

ADDITIONAL/DESCRIPTION REQUIREMENT: Inhalation hazard

II. HEALTH HAZARD INFORMATION

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EMERGENCY AND FIRST AID PROCEDURES

EYES:

OBJECT IS TO FLUSH MATERIAL OUT IMMEDIATELY AND THEN SEEK MEDICAL ATTENTION. IMMEDIATELY flush eyes with a directed stream of water for at least 15 minutes while forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Washing eyes within one (1) minute is essential to achieve maximum effectiveness. SEEK MEDICAL ATTENTION IMMEDIATELY.

CAS : Chemical Abstract Service Number NO : No relevant information found or not available
PEL : OSHA Permissible Exposure Limit CDRP : Corporate Exposure Limit
TLV : ACGIH Threshold Limit Value, Current * : See Chronic Effects Information NA : Not applicable
IMPORTANT: The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY, OR GUARANTY, EXPRESS OR IMPLIED IS MADE REGARDING PERFORMANCE, STABILITY, OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling and storage. Other factors may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as a recommendation to infringe any existing patents or violate any Federal, State or local laws.

II. HEALTH HAZARD INFORMATION (Continued)

SKIN:

IMMEDIATELY flush contaminated skin with water and wash with soap and water. If clothing is penetrated, IMMEDIATELY use safety shower - remove clothing and flush skin with copious amounts of water for at least 15 minutes. GET PROMPT MEDICAL ATTENTION. Wash clothing before reuse.

INHALATION:

Move exposed person to fresh air at once. Keep affected person warm and at rest. If breathing is difficult, have trained person administer oxygen. If breathing has stopped, perform mouth-to-mouth resuscitation. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION:

Unlikely to occur. If victim is conscious, administer large quantities of water IMMEDIATELY. Do not induce vomiting. GET IMMEDIATE MEDICAL ATTENTION.

ROUTES OF EXPOSURE

INHALATION:

Irritation of upper respiratory tract occurs at concentrations above 140 ppm. Ammonia fumes may cause severe breathing difficulties which may be delayed in onset.

SKIN:

Severe irritant. Contact with liquid ammonia may produce severe burns of the skin.

EYE CONTACT:

Aqueous Ammonia rapidly penetrates ocular tissue and may cause permanent damage. Exposure to high concentrations may cause temporary blindness. Contact with liquid ammonia may cause severe eye burns.

INGESTION:

Not a likely route of exposure.

EFFECTS OF OVEREXPOSURE

ACUTE:

Severely irritating to skin, eyes, respiratory and digestive tracts. Contact with liquid may cause severe burns and irreversible damage.

CHRONIC:

Prolonged inhalation of ammonia at concentrations above the PEL may cause bronchitis and/or pneumonia, with residual reduction in pulmonary function.

TOXICOLOGY DATA:

Acute Inhalation LC50	(mouse)	4230 ppm(2945 mg/m3)1hr
Acute inhalation LC50	(rat)	2000 ppm(1400 mg/m3)4hr

Inhalation of concentrations of 1750-4600 mg/m3 (2430-6390 ppm) causes shortness of breath, bronchospasm, chest pain and pulmonary edema which may be fatal. Maximum tolerable concentration in one hour is between 210-350 mg/m3 (290-485 ppm). Prolonged and repeated exposure to very high concentrations (eg: 165ppm) may also result in kidney damage.

Subchronic (42-day) inhalation toxicity studies were performed in rats, guinea pigs, rabbits, dogs and monkeys. Animals were exposed for 8hr/day, 5 days/week over a dose range of 165-611 ppm. At the low dose, nonspecific changes were observed in lungs and kidneys. At the high dose (611ppm) all animals developed pneumonitis and many had kidney damage. In a second subchronic inhalation study with rats and mice, 500 ppm ammonia induced increases in the weights of the lungs and kidneys plus signs of upper respiratory tract irritation.

III. IMPORTANT COMPONENTS

CAS NUMBER / NAME

76644 17 Ammonia

EXPOSURE LIMITS

STEL=35 ppm; 27 mg/m3
TLV=25 ppm; 17 mg/m3
STEL=35 ppm; 24 mg/m3

PERCENTAGE

VOL 99.70
WT 99.70

COMMON NAMES:

ANHYDROUS AMMONIA

Listed On(List Legend Below):

01 02 13 18 21

See Section II

All components of this product that are required to be on the TSCA Inventory are listed on the inventory.

Not listed as carcinogen - IARC, NTP, OSHA

LIST LEGEND

1 SARA EXTR HAZ SUB, SECTION 302
13 PA ENVIRONMENTAL HAZ SUBSTANCE
21 NJ SPECIAL HEALTH HAZ SUB

2 SARA TOXIC CHEM, SECTION 313
18 NY HAZARDOUS SUBSTANCES

IV. FIRE AND EXPLOSION DATA

FLASH POINT: NA AUTOIGNITION TEMPERATURE: 651°C (1204°F)

FLAMMABLE LIMITS IN AIR, % BY VOLUME- UPPER: 27
LOWER: 16

EXTINGUISHING MEDIA:

Use water spray, fog, foam, dry chemicals, CO2, or other agents as appropriate for materials in the fire.

SPECIAL FIRE FIGHTING PROCEDURES:

Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus and full protective equipment. Evacuate area if tanks are leaking or heavily exposed to heat.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Excessive heat will form nitrogen oxides.

V. SPECIAL PROTECTION

VENTILATION REQUIREMENTS:

Provide good general room ventilation to minimize exposure. Use local exhaust ventilation at points of emission.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY:

Use NIOSH/MSHA approved ammonia vapor respirator for areas where airborne exposure is excessive.

EYE:

Wear safety glasses with side shields or chemical goggles.

GLOVES:

Wear protective gloves made of vinyl, neoprene or rubber to minimize skin contact. Wash thoroughly after handling.

OTHER CLOTHING AND EQUIPMENT:

Eye wash facility and emergency shower should be in close proximity. Use of chemical resistant clothing, face shield and rubber shoes are recommended.

DO 085880
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VI. PHYSICAL DATA

BOILING POINT @ 760 mm Hg: -33.3°C (-28°F)
MELTING POINT: -77.7°C
VAPOR PRESSURE: 5 ATM @ 4.4°C (40°F)
SPECIFIC GRAVITY (H₂O=1): 0.7 @ -33.3°C
SOLUBILITY IN H₂O % BY WT: 51 @ 20°C
VAPOR DENSITY (Air=1): 0.597 @ 80°C and 1 ATM
APPEARANCE AND ODOR: Colorless gas, pungent odor
pH: NA
% VOLATILE: 100

VII. REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY:

Avoid heat and ignition sources. Avoid storage with oxidizing gases, chlorine, bromine, iodine, and acids. May form explosive compounds on contact with silver, mercury or halogens. Reacts with copper, copper alloys, aluminum alloys and galvanized surfaces.

INCOMPATIBILITY:

Silver, mercury, halogens, copper, copper alloys, aluminum alloys and galvanized surfaces.

HAZARDOUS DECOMPOSITION PRODUCTS:

Products of decomposition include oxides of nitrogen.

VIII. HANDLING AND STORAGE

HANDLING AND STORAGE PRECAUTIONS:

Store in a cool, dry, well ventilated, fire-resistant area separate from acids and oxidizing gases, bleach and chlorates. Provide automatic monitoring system. Avoid copper, copper alloy, aluminum alloy or galvanized fittings. Wear protective equipment to prevent contact.

IX. ENVIRONMENTAL PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Keep unprotected people away. Stay upwind of source. Personnel involved in clean-up must wear full protective equipment and self-contained breathing apparatus. Use copious amounts of water spray to reduce concentration and vapor pressure. Contaminated area and equipment should be thoroughly washed down with water. Do not allow substance to enter sewers or streams.

WASTE DISPOSAL METHOD:

Dilute with water and drain to waste treatment facilities. Dispose of in accordance with federal, state and local regulations. Report spills of 100 pounds or more to the National Response Center, 1-800-424-8802.

DO 085881
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X. ADDITIONAL INFORMATION

Shipment regulated by US DOT. Classified as non-flammable material, requires a non-flammable DOT label, and is assigned UN # 1005. Designated hazardous substance by 29 CFR Sec 1910 Subpart Z by OSHA. Designated hazardous substance by ACGIH.

Sec 311 of Clean Water Act lists as hazardous which, if discharged to or upon water may require immediate response to mitigate danger to public. Spills of 100 pounds or more must be reported to the National Response Center 1-800-424-8802.

Listed under provisions of Sec 304 of The Clean Water Act which requires the EPA administrator to establish water quality criteria reflecting the latest scientific knowledge concerning specific pollutants. Listed on a composite list as required under Sec 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), usually referred to as Superfund.

OSHA Standard 29CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, material safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Material Safety Data Sheet available to your employees.

To aid our customers in complying with regulatory requirements, SARA Title III hazard categories for this product are indicated in Section I. If the word "YES" appears next to any category, this product may be reportable by you under the requirements of 40 CFR Part 370. Please consult those regulations for details.

This product contains a toxic chemical or chemicals subject to the reporting requirements of SECTION 313 of TITLE III of the SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 and 40 CFR PART 372. (See Section III, List Legend 02)

XI. PREPARATION INFORMATION

For additional Non-Emergency health, safety, or environmental information telephone (716) 286-3606, or write to:
Occidental Chemical Corporation
Product Stewardship Department
Suite 400
360 Rainbow Boulevard South
Niagara Falls, NY 14302

For Emergencies: 24 HOUR EMERGENCY PHONE: (716) 278-7021

This MSDS replaces OCC MSDS dated 10/02/90.

WARNING LABEL INFORMATION

Occidental Chemical Corporation
Agricultural Products Inc. 4830 West Kennedy Blvd.,
Suite 950, Tampa, Florida 33609 (Telephone 813-286-3800)

In case of CHEMICAL EMERGENCIES - Call (716) 278-7021 (24 hours)

CAS Number: 7664-41-7

SIGNAL WORD: DANGER

STATEMENT OF HAZARDS:

COMPRESSED LIQUIFIED GAS UNDER PRESSURE.
LIQUID CAUSES SEVERE BURNS TO EYES AND SKIN.
VAPOR EXTREMELY IRRITATING TO EYES, SKIN AND RESPIRATORY TRACT.
MAY BE FATAL IF INHALED OR INGESTED.
PROLONGED EXPOSURE MAY REDUCE PULMONARY FUNCTION.

PRECAUTIONARY STATEMENTS:

Do not breathe vapor.
Insure adequate ventilation or use NIOSH/MSHA approved respirator
with ammonia cartridge.
Do not get in eyes, on skin or on clothing.
Use goggles, face shield and rubber boots.
Wear gloves and protective clothing made of vinyl, neoprene or
rubber.
Keep away from heat, sparks and open flame.

FIRST AID:

IN CASE OF CONTACT:

FOR EYES:

OBJECT IS TO FLUSH MATERIAL OUT IMMEDIATELY AND THEN SEEK
MEDICAL ATTENTION. IMMEDIATELY flush eyes with a directed stream
of water for at least 15 minutes while forcibly holding eyelids
apart to ensure complete irrigation of all eye and lid tissue.
Washing eyes within one (1) minute is essential to achieve
maximum effectiveness. SEEK MEDICAL ATTENTION IMMEDIATELY.

FOR SKIN:

IMMEDIATELY flush contaminated skin with water and wash with
soap and water. If clothing is penetrated, IMMEDIATELY use
safety shower - remove clothing and flush skin with copious
amounts of water for at least 15 minutes. GET PROMPT MEDICAL
ATTENTION. Wash clothing before reuse.

IF INHALED:

Move exposed person to fresh air at once. Keep affected person
warm and at rest. If breathing is difficult, have trained person
administer oxygen. If breathing has stopped, perform
mouth-to-mouth resuscitation. GET IMMEDIATE MEDICAL ATTENTION.

IF SWALLOWED:

Unlikely to occur. If victim is conscious, administer large
quantities of water IMMEDIATELY. Do not induce vomiting. GET
IMMEDIATE MEDICAL ATTENTION.

IN CASE OF:

SPILL OR LEAK:

Wear full protective equipment and clothing
Use copious amounts of water spray to reduce concentration and
vapor pressure.
Evacuate unprotected personnel in downwind areas
Keep contaminated water out of sewers and streams

OCCIDENTAL CHEMICAL
MSDS NUMBER: M8363
PRODUCT NAME: AMMONIA, ANHYDROUS

Page 7 of 7
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WARNING LABEL INFORMATION (Continued)

FIRE:

Wear self-contained breathing apparatus and full protective clothing.

Use water spray, foam, dry chemicals, CO2 or other extinguishing medium as appropriate for surrounding fire.

Evacuate area if tanks are leaking or heavily exposed to heat.

HANDLING AND STORAGE:

Store in cool, dry, well ventilated area with automatic monitoring system.

Store separate from acids, oxidizing gases, bleach, chlorates and metals.

DISPOSAL:

Dilute with water and drain to waste treatment facilities.

Dispose of in accordance with federal, state and local regulations.

Report spills of 100 pounds or more to the National Response Center, 1-800-424-8802.

INFORMATION REQUIRED BY FEDERAL, STATE OR LOCAL REGULATIONS:

This product contains:

CAS#	NAME
7664417	Ammonia

HMIS RATING SYSTEM: HEALTH 3* FLAMMABILITY 1 REACTIVITY 1

FOR INDUSTRIAL USE ONLY LABEL 101M8363

For further information, Request OCC MSDS M8363

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LANG'S STANDARD SOLUTIONS, INC.
13445 S. Harrell's Ferry Road
Baton Rouge, Louisiana 70816

MATERIAL SAFETY DATA SHEET

SECTION 1 - NAME & PRODUCT

CATALOG NO.: 1243
CHEMICAL NAME: Ammonium Hydroxide 10%
TRADE NAME & SYNONYMS: Ammonia Water
CHEMICAL FAMILY: Alkali Solution
FORMULA: N/A

SECTION 2 - PHYSICAL DATA

BOILING POINT 760 mm Hg (°C): 103°C-108°C
MELTING POINT (°C): N/A
VAPOR PRESSURE @ 20°C: 12
VAPOR DENSITY (air=1): 1.2
PERCENT VOLATILES BY VOLUME: 100%
SPECIFIC GRAVITY (H₂O=1): 1.00
SOLUBILITY IN H₂O, % BY WT. @ 20°C: Miscible
APPEARANCE AND ODOR: Greenish colored liquid with pungent odor
EVAPORATION RATE (BUTYL ACETATE=1): N/A

SECTION 3 - FIRE & EXPLOSION HAZARD DATA

FLASH POINT-TEST METHOD: N/A
LEL: N/A
UEL: N/A
EXTINGUISHING MEDIA: Appropriate for extinguishing surrounding fire.
SPECIAL HAZARDS & PROCEDURES: N/A
UNUSUAL FIRE & EXPLOSION HAZARDS: N/A

SECTION 4 - REACTIVITY DATA

STABLE/UNSTABLE: Stable
MATERIALS TO AVOID: Acids Oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS: Ammonia Nitrogen compounds

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SECTION 5 - SPILLS OR LEAK PROCEDURES & DISPOSAL

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Pickup with absorbent. Rinse area with water.

WASTE DISPOSAL METHOD: In accordance with local state and federal regulations.

SECTION 6 - HEALTH HAZARD

THRESHOLD LIMIT VALUE: Toxicity: LD50 (ORL-RAT) 350 mg/Kg

EFFECTS OF OVEREXPOSURE: Irritant to skin eyes mucous membranes and respiratory tract.

FIRST AID PROCEDURES: Rinse eyes and skin with clean water. If inhaled - remove to fresh air. If irritation persists - see a physician.

SECTION 7 - PROTECTION INFORMATION

VENTILATION, RESPIRATORY PROTECTION, PROTECTIVE CLOTHING, EYE PROTECTION: Use only with adequate ventilation. Do not breathe fumes. Use of safety glasses and gloves is recommended.

SECTION 8 - SPECIAL HANDLING & STORING PRECAUTIONS

SPECIAL HANDLING AND STORING PRECAUTIONS: Store out of sunlight and away from heat. Keep container closed when not in use.

SECTION 9 - HAZARDOUS INGREDIENTS (refer to Sections 3 through 8)

Ammonium Hydroxide 10% as NH_4OH

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SECTION 10 - OTHER INFORMATION

NFPA: HEALTH = 3 FLAMMABILITY = 1 REACTIVITY = 0
CORROSIVE MATERIAL.

DOT -

AUTHORIZED SIGNATURE: Thomas C. Luke
EMERGENCY TELEPHONE NUMBER: (504)291-0011
DATE ISSUED: May 17, 1986

DO 085887
CONFIDENTIAL

ANOXSYN™ 442

ANTI XIDANT SYNERGIST

EMERGENCY
TELEPHONE NUMBERS:
(215) 337-6615
(800) 424-9300 (CHEMTREC)

ADDRESS:
PENNWALT CORPORATION
PERFORMANCE CHEMICALS DEPT.
900 FIRST AVENUE
KING OF PRUSSIA, PA 19406

MATERIAL SAFETY DATA SHEET

PRODUCT IDENTIFICATION

**PRODUCT
NAME**

ANOXSYN™ 442

**PENNWALT
CODE NUMBER**

9559-2

CHEMICAL NAME

ALIPHATIC SULFIDE

CAS NUMBER

PROPRIETARY

CHEMICAL FAMILY

ALIPHATIC SULFIDE

HAZARDOUS INGREDIENTS

MATERIALS OR COMPONENTS	%WW
ALIPHATIC SULFIDE	100

SEE REVERSE SIDE
FOR DATA ON TOXICITY

SHIPPING INFORMATION

DOT I.D. NO.

NA

DOT CLASS

NA

SHIPPING NAME

NA

PHYSICAL PROPERTIES

PHYSICAL STATE

BOILING POINT/RANGE

NE

MELTING POINT

56-66°C

FREEZING POINT

NE

**MOLECULAR WEIGHT
(CALCULATED)**

CA 700

SPECIFIC GRAVITY (H₂O = 1)

0.85 @ 70°C

VAPOR PRESSURE (mm Hg)

NE

VAPOR DENSITY (AIR = 1)

NE

SOLUBILITY IN H₂O

NONE

% VOLATILES BY VOLUME

NA

EVAPORATION RATE

NE

APPEARANCE AND ODOR

WHITE POWDER

FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)

NE

FLAMMABLE LIMITS

NE

**AUTOIGNITION TEMPERATURE/
FIRE POINT**

NE

EXTINGUISHING MEDIA

☒ DRY CHEMICAL

☒ WATER FOG

☒ CO₂

**SPECIAL FIRE FIGHTING
PROCEDURES**

NE

**UNUSUAL FIRE AND
EXPLOSION HAZARDS**

NE

REACTIVITY DATA

STABILITY

☒ STABLE

**CONDITIONS CONTRIBUTING
TO INSTABILITY**

NE

**INCOMPATIBILITY—AVOID
CONTACT WITH**

☒ STRONG ACIDS

REACTIVITY DATA, CONTINUED

**HAZARDOUS DECOMPOSITION
PRODUCTS, THERMAL AND
OTHER:**

NE

CONDITIONS TO AVOID

☒ HEAT

☒ OPEN FLAMES

☒ IGNITION SOURCES

SPILL OR LEAK

**STEPS TO BE TAKEN IF
MATERIAL IS RELEASED
OR SPILLED**

☐ SWEEP OR SCOOP UP AND
REMOVE

☒ FLUSH WITH WATER

WASTE DISPOSAL METHOD:
DISPOSE IN ACCORDANCE WITH ALL
APPLICABLE LOCAL, STATE, AND
FEDERAL REGULATIONS

NA = NOT APPLICABLE
NE = NOT ESTABLISHED

CONTINUED ON OTHER SIDE

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MATERIAL
SAFETY
DATA SHEET

PENNWALT
PRODUCT NAME:
ANOXYN™ 442
ANTIOXIDANT SYNERGIST
CODE NUMBER:
9559-2

BEFORE USING PRODUCT, READ AND FOLLOW DIRECTIONS AND PRECAUTIONS ON PRODUCT LABEL AND BULLETINS.

TOXICITY

ORAL (ACUTE)

LD₅₀ (RAT) — >5,000 mg/kg

DERMAL (ACUTE)

LD₅₀ (RABBIT) — >2,000 mg/kg
(NO TOXIC EFFECTS)

INHALATION (ACUTE)

NE

CHRONIC, SUBCHRONIC, ETC.

THIS MATERIAL IS NOT LISTED BY
IARC, NTP OR OSHA AS A CAR-
CINOGEN NEGATIVE IN THE AMES
ASSAY.

OTHER EFFECTS

NE

HEALTH HAZARD INFORMATION

PERMISSIBLE EXPOSURE LIMIT (TLV/TWA OR CEILING [C])

ACGIH NE

OSHA NE

IRRITATION

NON IRRITATING TO
SKIN AND EYES

SENSITIZATION

NE

HEALTH HAZARD INFORMATION, CONTINUED

EMERGENCY FIRST AID

INGESTION

- ☒ GET MEDICAL ATTENTION
- ☒ INDUCE VOMITING

DERMAL

- ☒ FLUSH WITH SOAP AND WATER
- ☒ CONTAMINATED CLOTHING—
REMOVE AND LAUNDRY

EYE CONTACT

- ☒ GET MEDICAL ATTENTION
- ☒ FLUSH WITH PLENTY OF WATER
FOR AT LEAST 15 MINUTES

INHALATION

- ☒ GET MEDICAL ATTENTION
- ☒ REMOVE TO FRESH AIR

SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS—

ALWAYS MAINTAIN EXPOSURE
BELOW PERMISSIBLE
EXPOSURE LIMITS

- ☒ USE WITH ADEQUATE
VENTILATION

EYE

- ☒ SAFETY GLASSES

HAND (GLOVE TYPE)

- ☒ POLYVINYL CHLORIDE
- ☒ NEOPRENE
- ☒ BUTYL RUBBER
- ☒ NATURAL RUBBER
- ☒ POLYVINYL ALCOHOL
- ☒ POLYETHYLENE

RESPIRATOR TYPE—

- USE ONLY NIOSH/MESA
APPROVED EQUIPMENT
- ☒ FILTER, DUST, FUME, MIST

OTHER PROTECTIVE EQUIPMENT

NA

SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

- ☒ WASH THOROUGHLY AFTER
HANDLING.
- ☒ DO NOT GET IN EYES, ON SKIN
OR CLOTHING.
- ☒ DO NOT BREATHE DUST,
VAPOR MIST, GAS
- ☒ KEEP AWAY FROM HEAT
SPARKS AND OPEN FLAMES

OTHER HANDLING AND STORAGE CONDITIONS

NE

PLEASE NOTE

The above information is accurate to the best of our knowledge. 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, Pennwalt MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. User should satisfy himself that he has all current data relevant to his particular use.

PREPARED BY: RICHARD G. ADAMS

DATE: 3/10/88

ADDRESS:
PENNWALT CORPORATION
PERFORMANCE CHEMICALS
DEPARTMENT
900 FIRST AVENUE
KING OF PRUSSIA, PA 19406

PHONE:
(215) 337-6615

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