Safety Data Sheet

Material Name: Ammonia, Hydrogen, Methane, Argon, Nitrogen Gas Mix **SDS ID: 00244934**

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
Ammonia, Hydrogen, Methane, Argon, Nitrogen Gas Mix
Product Description
Classification determined in accordance with Compressed Gas Association standards.
Product Use
Industrial and Specialty Gas Applications
Restrictions on Use
None known.
Details of the supplier of the safety data sheet
MATHESON TRI-GAS, INC.
909 Lake Carolyn Parkway
Suite 1300
Irving, TX 75039
General Information: 1-800-416-2505
Emergency #: 1-800-424-9300 (CHEMTREC)
Outside the US: 703-527-3887 (Call collect)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
Flammable Gases - Category 1
Gases Under Pressure - Compressed gas
Acute Toxicity - Inhalation - Gas - Category 4
Skin Corrosion/Irritation - Category 1
Serious Eye Damage/Eye Irritation - Category 1
Specific Target Organ Toxicity - Single Exposure - Category 1 (Central Nervous System , respiratory system)
Specific Target Organ Toxicity - Repeated Exposure - Category 1 (respiratory system)
Specific Target Organ Toxicity - Repeated Exposure - Category 2
Simple Asphyxiant
GHS Label Elements
Symbol(s)

Signal Word
Danger
Hazard Statement(s)
Extremely flammable gas.
Contains gas under pressure; may explode if heated.
Harmful if inhaled.
Causes severe skin burns and eye damage.
Causes damage to organs.
Causes damage to organs through prolonged or repeated exposure.

May cause damage to organs through prolonged or repeated exposure.
May displace oxygen and cause rapid suffocation.

Precautionary Statement(s)

Prevention

Keep away from heat/sparks/open flame/hot surfaces - No smoking.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not breathe dust/fume/gas/mist/vapors/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.

Response

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources if safe to do so.
Immediately call a POISON CENTER or doctor.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage

Store in a well-ventilated place. Keep container tightly closed.
Protect from sunlight.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Other Hazards

Rapid release of compressed gas may cause frostbite.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
7664-41-7	Ammonia	0-100
74-82-8	Methane	0-100
1333-74-0	Hydrogen	0-100
7440-37-1	Argon	0-100
7727-37-9	Nitrogen	0-100

Section 4 - FIRST AID MEASURES

Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Skin

If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115°F; 41-46°C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

Eyes

Flush eyes immediately with large amounts of water. Remove contact lenses, if present and easy to do. Continue rinsing. Then get immediate medical attention.

Ingestion

If swallowed, do not induce vomiting. Rinse mouth. Get immediate medical attention.

Most Important Symptoms/Effects

Acute

frostbite, suffocation, respiratory tract burns, skin burns, eye damage

Delayed

No information on significant adverse effects.

Indication of any immediate medical attention and special treatment needed

For inhalation, consider oxygen.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

regular dry chemical, carbon dioxide; Large fires: water spray or fog, alcohol-resistant foam

Unsuitable Extinguishing Media

Do not direct water at source of leak or safety devices; icing may occur.

Special Hazards Arising from the Chemical

Severe fire hazard. Severe explosion hazard. Containers may rupture or explode if exposed to heat. Vapor/air mixtures are explosive above flash point. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

Hazardous Combustion Products

oxides of carbon, ammonia, oxides of nitrogen

Fire Fighting Measures

Move container from fire area if it can be done without risk. Damaged cylinders should be handled only by specialists. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with water spray until well after the fire is out. Do not get water inside container. Stay away from the ends of tanks. Flood with fine water spray. Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, Evacuation radius: 1600 meters (1 mile). Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. ALWAYS stay away from tanks engulfed in fire. For smaller tanks or cylinders, extinguish and isolate from other flammables. Stop flow of gas. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Special Protective Equipment and Precautions for Firefighters

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. Do not touch or walk through spilled material. Stop leak if possible without personal risk. Eliminate all ignition sources if safe to do so. All equipment used when handling the product must be grounded. If possible, turn leaking containers so that gas escapes rather than liquid. Do not direct water at spill or source of leak. Use water spray to reduce vapors or divert

vapor cloud drift. Isolate area until gas has dispersed. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering.

Environmental Precautions

Avoid release to the environment. Collect spillage.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Keep away from heat, sparks, open flame, and hot surfaces - No smoking. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe gas. Use only outdoors or in a well-ventilated area. In case of inadequate ventilation wear respiratory protection. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wear protective gloves/clothing and eye/face protection. Wash hands thoroughly after handling. Avoid release to the environment.

Conditions for Safe Storage, Including any Incompatibilities

Store in a well-ventilated place. Keep container tightly closed.

Protect from sunlight.

Store locked up.

Store and handle in accordance with all current regulations and standards. Store in a cool, dry place. Protect from physical damage. Keep separated from incompatible substances. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30).

Incompatible Materials

halogens, oxidizing materials, combustible materials, acids, metals, metal salts, amines, reducing agents, cyanides, bases

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Ammonia	**7664-41-7**
ACGIH:	25 ppm TWA
	35 ppm STEL
NIOSH:	25 ppm TWA ; 18 mg/m3 TWA
	35 ppm STEL ; 27 mg/m3 STEL
	300 ppm IDLH
Europe:	20 ppm TWA ; 14 mg/m3 TWA
	50 ppm STEL ; 36 mg/m3 STEL
OSHA (US):	50 ppm TWA ; 35 mg/m3 TWA
Mexico:	25 ppm TWA [VLE-PPT]
	35 ppm STEL [PPT-CT]

Methane	**74-82-8**
ACGIH:	(See Appendix F: Minimal Oxygen Content, explosion hazard)
Mexico:	1000 ppm TWA [VLE-PPT]
Hydrogen	**1333-74-0**
ACGIH:	(See Appendix F: Minimal Oxygen Content, explosion hazard)
Argon	**7440-37-1**
ACGIH:	(See Appendix F: Minimal Oxygen Content)
Nitrogen	**7727-37-9**
ACGIH:	(See Appendix F: Minimal Oxygen Content)

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)
There are no biological limit values for any of this product's components.

Engineering Controls
Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection
Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection
For the gas: Wear appropriate chemical resistant clothing. For the liquid: Wear appropriate protective, cold insulating clothing.

Respiratory Protection
Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Glove Recommendations
Wear chemical resistant, insulated gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	colorless gas	**Physical State**	gas
Odor	Not available	**Color**	colorless
Odor Threshold	Not available	**pH**	Not available
Melting Point	Not available	**Boiling Point**	Not available

Boiling Point Range	Not available	**Freezing point**	Not available
Evaporation Rate	Not available	**Flammability (solid, gas)**	Flammable gas
Autoignition Temperature	Not available	**Flash Point**	Not available
Lower Explosive Limit	Not available	**Decomposition temperature**	Not available
Upper Explosive Limit	Not available	**Vapor Pressure**	Not available
Vapor Density (air=1)	Not available	**Specific Gravity (water=1)**	Not available
Water Solubility	Not available	**Partition coefficient: n-octanol/water**	Not available
Viscosity	Not available	**Kinematic viscosity**	Not available
Solubility (Other)	Not available	**Density**	Not available
Physical Form	Compressed Gas	**Molecular Weight**	Not available

Other Information
No additional information is available.

Section 10 - STABILITY AND REACTIVITY

Reactivity
No reactivity hazard is expected.
Chemical Stability
Stable at normal temperatures and pressure.
Possibility of Hazardous Reactions
Will not polymerize.
Conditions to Avoid
Protect from physical damage. Containers may rupture or explode if exposed to heat. Minimize contact with material. Avoid contact with incompatible materials.
Incompatible Materials
halogens, oxidizing materials, combustible materials, acids, metals, metal salts, amines, reducing agents, cyanides, bases
Hazardous decomposition products
oxides of carbon, ammonia, oxides of nitrogen

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure
Inhalation
burns, nausea, vomiting, difficulty breathing, irregular heartbeat, headache, drowsiness, fatigue, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma, mutagenic effects, respiratory system damage, lung damage
Skin Contact
frostbite, burns
Eye Contact
frostbite, eye damage

Ingestion
burns
Acute and Chronic Toxicity
Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and the following selected endpoints are published:
Ammonia (7664-41-7)
Oral LD50 Rat 350 mg/kg (test substance administered in an aqueous solution)
Inhalation LC50 Rat 9850 mg/m3 1 h (males)
Methane (74-82-8)
Dermal LD50 Rat >2000 mg/kg
Inhalation LC50 Rat 539600 ppm 2 h
Hydrogen (1333-74-0)
Inhalation LC50 Rat >15000 ppm 1 h
Product Toxicity Data
Acute Toxicity Estimate

Dermal	> 2000 mg/kg

Immediate Effects
frostbite, suffocation, respiratory tract burns, skin burns, eye damage
Delayed Effects
No information on significant adverse effects.
Irritation/Corrosivity Data
respiratory tract burns, skin burns, eye burns
Respiratory Sensitization
No information available for the product.
Dermal Sensitization
No information available for the product.
Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA.
Germ Cell Mutagenicity
No information available for the product.
Tumorigenic Data
No information available for the product.
Reproductive Toxicity
No information available for the product.
Specific Target Organ Toxicity - Single Exposure
respiratory tract
Specific Target Organ Toxicity - Repeated Exposure
No target organs identified.
Aspiration hazard
Not applicable.
Medical Conditions Aggravated by Exposure
No data available.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

Ammonia	**7664-41-7**

Fish:	LC50 96 h Cyprinus carpio 0.44 mg/L; LC50 96 h Lepomis macrochirus 0.26 - 4.6 mg/L; LC50 96 h Lepomis macrochirus 1.17 mg/L [flow-through]; LC50 96 h Pimephales promelas 0.73 - 2.35 mg/L; LC50 96 h Pimephales promelas 5.9 mg/L [static]; LC50 96 h Poecilia reticulata >1.5 mg/L; LC50 96 h Poecilia reticulata 1.19 mg/L [static]
Invertebrate:	LC50 48 h Daphnia magna 25.4 mg/L IUCLID

Persistence and Degradability
No data available for the mixture.
Bioaccumulative Potential
No data available for the mixture.
Mobility
No data available for the mixture.
Other Toxicity
No additional information is available.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose in accordance with all applicable regulations.
Component Waste Numbers
The U.S. EPA has not published waste numbers for this product's components.

Section 14 - TRANSPORT INFORMATION

US DOT Information:
Shipping Name: COMPRESSED GAS, FLAMMABLE, N.O.S. , (Contains: highest concentration component , second highest concentration component)
Hazard Class: 2.1
UN/NA #: UN1954
Required Label(s): 2.1

IMDG Information:
Shipping Name: COMPRESSED GAS, FLAMMABLE, N.O.S. , (Contains: highest concentration component , second highest concentration component)
Hazard Class: 2.1
UN#: UN1954
Required Label(s): 2.1
International Bulk Chemical Code
This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations
This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

Ammonia	**7664-41-7**
SARA 302:	500 lb TPQ

SARA 313:	1 % de minimis concentration (includes anhydrous Ammonia and aqueous Ammonia from water dissociable Ammonium salts and other sources, 10% of total aqueous Ammonia is reportable under this listing)
CERCLA:	100 lb final RQ ; 45.4 kg final RQ
OSHA (safety):	10000 lb TQ (anhydrous); 15000 lb TQ (solution ,>44% Ammonia by weight)
SARA 304:	100 lb EPCRA RQ

SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories
Flammable; Gas Under Pressure; Acute toxicity; Skin Corrosion/Irritation; Serious Eye Damage/Eye Irritation; Specific Target Organ Toxicity; Simple Asphyxiant

U.S. State Regulations
The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
Ammonia	**7664-41-7**	Yes	Yes	Yes	Yes	Yes
Methane	**74-82-8**	No	Yes	Yes	Yes	Yes
Hydrogen	**1333-74-0**	Yes	Yes	Yes	Yes	Yes
Argon	**7440-37-1**	No	Yes	Yes	Yes	Yes
Nitrogen	**7727-37-9**	No	Yes	Yes	Yes	Yes

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)
Not listed under California Proposition 65.

Component Analysis - Inventory
Ammonia (7664-41-7)

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	Yes	Yes	Yes	No

KR - REACH CCA	MX	NZ	PH	TH-TECI	TW, CN	VN (Draft)
Yes	Yes	Yes	Yes	Yes	Yes	Yes

Methane (74-82-8)

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	Yes	Yes	Yes	No

KR - REACH CCA	MX	NZ	PH	TH-TECI	TW, CN	VN (Draft)
No	Yes	Yes	Yes	Yes	Yes	Yes

Hydrogen (1333-74-0)

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	Yes	No	Yes	No

KR - REACH CCA	MX	NZ	PH	TH-TECI	TW, CN	VN (Draft)
No	Yes	Yes	Yes	Yes	Yes	Yes

Argon (7440-37-1)

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	Yes	No	Yes	No

KR - REACH CCA	MX	NZ	PH	TH-TECI	TW, CN	VN (Draft)
No	Yes	Yes	Yes	Yes	Yes	Yes

Nitrogen (7727-37-9)

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	Yes	No	Yes	No

KR - REACH CCA	MX	NZ	PH	TH-TECI	TW, CN	VN (Draft)
No	Yes	Yes	Yes	Yes	Yes	Yes

Section 16 - OTHER INFORMATION

NFPA Ratings
Health: 3 Fire: 4 Instability: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
Summary of Changes
05/05/2021 - Update to Section(s) 14: TRANSPORT INFORMATION.
Preparation Date
07/17/2017
Revision date
05/05/2021
Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC – European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL) , KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; KR REACH CCA - Korea Registration and Evaluation of Chemical Substances Chemical Control Act; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX – Mexico; Ne- Non-specific; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; Nq - Non-quantitative; NSL – Non-Domestic Substance List (Canada); NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL- Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA – Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TH-TECI - Thailand - FDA Existing Chemicals Inventory (TECI); TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW – Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; VLE - Exposure Limit Value (Mexico); VN (Draft) - Vietnam (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada).

Other Information

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