

Y.P.CHEMICALS

Room No 3 11th Floor 75C Park Street Kolkata 700016

MATERIAL SAFETY DATA SHEET

1. CHEMICAL IDENTITY :

Chemical Name : AMMONIA
Chemical Classification : Flammable & Poisonous, Classes-2(1) & 2(b)
Synonyms : Anhydrous Ammonia
Aqua Ammonia
Aqueous Ammonia
Spirit of Hartshorn
Formula : NH₃
C.A.S. No. : 7664-41-7
U.N. No. : 1005-IS
Regulated Identification :
Shipping Name : Ammonia
Codes/Label : 2(1) Flammable Gas

Label-Diamond with black margin and orange colour.
Fire Mark in the upper half. Class 2(a) printed at lower corner.

2(b) Poisonous Gas.

Label – Diamond with black margin & no colour. Skull & cross bone in the upper half. Class 2(b) printed in the lower corner.

Hazchem No. : 2PE
Hazardous Waste I.D. No. : N.A.
Hazardous Ingredients : C.A.S. No. 7664-41-7 Ammonia 100%

2. PHYSICAL AND CHEMICAL DATA :

Boiling Point : -33.25^o C
Melting Point : -77.7^o C
Vapour Density : 0.59 at 25^o C (Air-1)
Specific Gravity : 0.77 atm (Waste=1)
Physical State : Gas, Liquid under pressure
Vapour Pressure : 10 atm at 25.7^o C
Solubility in water : Very soluble in water
PH : Alkaline (>7)
Appearance : Colourless gas
Odour : Pungent and suffocating
Others : Critical Pressure : 114.25 bar
Critical Temp. : 132.4^o C
Critical Density : 235 kg/m³

3. FIRE AND EXPLOSION HARD DATA :

Flammability : Yes (slow)
TDG Flammability : 2A (Inflammable Gases)
: 2B (Poisonous Gas)
Explosion Sensitivity to impact : None
Hazardous Polymerization : None
Combustible Liquid : Combustible, but difficult to ignite
Lower Explosive Limit (LEL) : 16% Flash Point
Upper Explosive Limit (UEL) : 25% Flash Point
Explosive Material : With strong oxidizer; vigorous and highly exothermic reaction with the explosion does occur between Ammonia & strong oxidizers, like oxy acids of chlorine & their salts, chromium trioxide, picric acid & liquid or solid dinitrogen tetroxide. Contact with mercury, calcium & silver oxides will also form explosive mixture.
Explosion Sensitivity to static: Not such sensitive to static electricity.
Corrosive Material : Moist Ammonia corrodes copper & its alloys & zinc.
Auto ignition temp. : 651^oC
Hazardous Combustible : Toxic fumes of NH and NOx are emitted on

Product combustion.

Flammable Material : Ammonia burn in oxygen with yellow flame.
Pyrophoric Material : None
Oxidiser : None
Organic Peroxide : None
Others : The presence of oil and other combustible materials increase the fire potential. The concentration of ammonia is seldom build up in practice. However, explosive range is broadened by presence of more oxygen on higher temperature and pressure than atmospheric conditions.

4. REACTIVITY DATA :

Chemical Stability : Normally stable, but on heating or under electric discharge breaks up into nitrogen and hydrogen.
Incompatibility with other: Silver, Acetaldehyde, Acrolein, Boron, Halogens, Chlorites, Chlorosilane, Chromyl Chloride, Materials Ethylene, Gold Hexachloromelamine, HBr, HNO₃, N₂O₄, NC₁₃, NF₃, Picric acid, Potassium Ferricyanide, Potassium Mercuric Cyanide, Silver Chloride, Silver Nitrate, Gold (111) Chloride.

Reactivity :

- Halogenated nitrogen formed with halogens (i.e. C₁₂, Br₂ and I₂)
- Forms ammonia chlorate, which have explosion potential with chlorates.
- Reacts directly with acids to form salts.
- Most common metals are not affected by dry ammonia but it reacts/attacks copper, zinc and alloys containing copper in presence of moisture.

Hazardous Reaction Products : Nox when heated in excess air/oxygen.

5. HEALTH HAZARDS DATA :

Route of Entry : Inhalation, Skin Absorption and Injection.
Effects of Exposure /Symptoms: Intensely irritating to the mucous membrane, eyes and skin. Eye symptoms range from lacrimation, corneal ulceration & blindness. Mild to moderate exposure can produce headache, salivation, burning of throat, perspiration, nausea, vomiting & substantial pain. In severe exposure bronchitis or pneumonia may follow.

Effect of various concentration of Ammonia Gas in air is given below:-

Degree of Hazard	Concentration in air by volume
Least perceptible odour	: 5 ppm
Readily detectable odour	: 20-50 ppm
Irritation of Upper respiratory tract	: 100 ppm (minimum)
Deep lung irritation	: 500 ppm (minimum)
Coughing, Bronchial Spasms	: 1700 ppm
Dangerous, less than ½ hour	: 2000 to 3000 ppm
Exposure may prove fatal	
Serious Oedema, strangulation, Asphyxia, rapidly fatal	: 5000 to 10000 ppm
Immediately fatal	: 10000 ppm

Emergency Treatment:

Remove the affected person to an uncontaminated place and flush immediately the affected parts of the body with large quantity of water. Remove contaminated clothing and keep the victim comfortably warm and quiet till the physician arrives.

Eye Contact:

If eyes have been affected treat them first. Irrigate the eyes immediately with large quantity of water or with a solution of 0.5% alum and on an Ophthalmologist for further treatment.

Remember : No oil or ointment should be applied until prescribed by Ophthalmologist.