MATERIAL SAFETY DATA SHEET

according to the Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 12/12/2012 Version 1.2

SECTION 1. Identification

Product identifier

Product number	815008
Millipore Ref.	8150080010 AMMONIA-D3 26% SOLUTION IN D2O 8150080025 AMMONIA-D3 26% SOLUTION IN D2O
Product name	Ammonia-D3 26% solution in D_2O deuteration degree min. 99.5% for NMR spectroscopy MagniSolv™

Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Use restricted under TSCA to research and development or as analytical reagent. Uses regulated under FDA or FIFRA are not affected. Reagent for analysis

Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation | 290 Concord Road, Billerica, MA 01821, United States of America | SDS Phone Support: +1-978-715-1335 | General Inquiries: +1-978-751-4321 | Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5) e-mail: mm_sds@merckgroup.com
Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2. Hazards identification

GHS Classification

Corrosive to Metals, Category 1, H290
Skin corrosion, Category 1B, H314
Specific target organ systemic toxicity - single exposure, Category 3, H335
Acute aquatic toxicity, Category 1, H400

For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms

Signal Word
Danger

Hazard Statements
H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.
H335 May cause respiratory irritation.
H400 Very toxic to aquatic life.

Precautionary Statements
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.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309 + P310 IF exposed or if you feel unwell: Immediately call a POISON CENTER or doctor/physician.

OSHA Hazards
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Other hazards
None known.

SECTION 3. Composition/information on ingredients

Chemical nature	Aqueous ammoniacal solution. (deuterated form)	
Formula	ND_4OD	D_5NO (Hill)

Hazardous ingredients
Chemical Name (Concentration)
CAS-No.

$[^2H_4]$ammonium-$[^2H]$hydroxide (>= 10 % - < 30 %)
12168-30-8

SECTION 4. First aid measures

Description of first-aid measures
Inhalation
After inhalation: fresh air. Call in physician.

Skin contact
After skin contact: wash off with plenty of water. Immediately remove contaminated clothing. If available swab with polyethylene glycol 400. Call a physician immediately.

Eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.

Ingestion
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation!). Call a physician immediately. Do not attempt to neutralize.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed
Irritation and corrosion, bronchitis, Cough, Shortness of breath, gastric pain, Unconsciousness, Bloody vomiting, Nausea, collapse, shock
Risk of blindness!

Indication of any immediate medical attention and special treatment needed
No information available.

SECTION 5. Fire-fighting measures

Extinguishing media
Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture
Not combustible.
Ammonia solution itself is not flammable, but can form an ignitable ammonia/air-mixture by outgassing.
Ambient fire may liberate hazardous vapors.
Fire may cause evolution of:
nitrogen oxides

Advice for firefighters
Special protective equipment for fire-fighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information
Cool closed containers exposed to fire with water spray. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions
Do not empty into drains.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.
Observe possible material restrictions (see sections 7 and 10).
Take up with liquid-absorbent and neutralizing material (e.g. Chemizorb® OH^-, Merck Art. No. 101596). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Observe label precautions.

Conditions for safe storage, including any incompatibilities

Tightly closed.

Store at +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
[$^2H_4$)ammonium-[^2H]hydroxide 12168-30-8			
ACGIH	Time Weighted Average (TWA):	25 ppm	
	Short Term Exposure Limit (STEL):	35 ppm	
NIOSH/GUIDE	Recommended exposure limit (REL):	25 ppm 18 mg/m³	
	Short Term Exposure Limit (STEL):	35 ppm 27 mg/m³	
OSHA_TRANS	PEL:	50 ppm 35 mg/m³	
Z1A	Short Term Exposure Limit (STEL):	35 ppm 27 mg/m³	

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Tightly fitting safety goggles

Hand protection
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Other protective equipment:
protective clothing

Respiratory protection
required when vapors/aerosols are generated.
Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	stinging
Odor Threshold	0.03 - 0.05 ppm Ammonia
pH	at 68 °F (20 °C) strongly alkaline
Melting point	No information available.
Boiling point/boiling range	ca. 97 °F (36 °C)
Flash point	No information available.
Evaporation rate	No information available.
Flammability (solid, gas)	not applicable
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapor pressure	535 hPa at 68 °F (20 °C)
Relative vapor density	No information available.
Relative density	1.056 g/cm³ at 68 °F (20 °C)
Water solubility	at 68 °F (20 °C) soluble

Partition coefficient: n-octanol/water	log Pow: -1.38 (experimental) (anhydrous substance) Bioaccumulation is not expected (log Pow <1).
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.
Explosive properties	Not classified as explosive.
Minimum ignition energy	380 - 680 mJ
Corrosion	May be corrosive to metals.

SECTION 10. Stability and reactivity

Reactivity
See below

Chemical stability
Ammonia solution itself is not flammable, but can form an ignitable ammonia/air-mixture by outgassing.

Possibility of hazardous reactions
A risk of explosion and/or of toxic gas formation exists with the folllowing substances:

Oxidizing agents, Phosgene, Oxides of phosphorus, Mercury, acids, Nitric acid, Oxygen, sulfur dioxide, hydrogen sulfide, silver compounds, nitrogen oxides, nitrogen trichloride, hydrogen peroxide, silver, Lead, Zinc, Heavy metals, Heavy metal salts, strong alkalis, Acrolein, antimony hydride, Boron, hydrogen bromide, chlorates, Hydrogen chloride gas, chromium(VI) oxide, chromyl chloride, dimethylsulfate, Ethylene oxide, Hydrogen fluoride, halogens, halogen-halogen compounds, halogen oxides, carbon dioxide, Acids

Conditions to avoid
Heating.

Incompatible materials
Aluminum, Lead, Copper, various metals, metal alloys, Nickel, silver, Zinc

Hazardous decomposition products
in the event of fire: See section 5.

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure
Inhalation, Eye contact, Skin contact, Ingestion

Acute oral toxicity
LDLO human: 43 mg/kg (29% solution) (RTECS)
Symptoms: gastric pain, Bloody vomiting, If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

Skin irritation
rabbit
Result: Severe irritations
(29% solution) (RTECS)

Dermatitis Necrosis
Mixture causes burns.

Eye irritation
rabbit
Result: Severe irritations
(29% solution) (RTECS)

Mixture causes serious eye damage. Risk of blindness!

Sensitization
Sensitization test: guinea pig
Result: negative
(anhydrous substance) (IUCLID)

Genotoxicity in vitro
Ames test
Salmonella typhimurium
Result: negative
(anhydrous substance) (IUCLID)

Ames test
Escherichia coli
Result: negative
(anhydrous substance) (IUCLID)

Specific target organ systemic toxicity - single exposure
Mixture may cause respiratory irritation.

Specific target organ systemic toxicity - repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard
Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen

	by NTP.
ACGIH	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Further information

Systemic effects:
Nausea, collapse, shock, Shortness of breath, Unconsciousness
Further data:
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish
LC50 Oncorhynchus mykiss (rainbow trout): 0.53 mg/l; 96 h (anhydrous substance) (Lit.)

Toxicity to daphnia and other aquatic invertebrates
EC50 Daphnia magna (Water flea): 24 mg/l; 48 h (anhydrous substance) (Lit.)

Toxicity to bacteria
EC50 Photobacterium phosphoreum: 2 mg/l; 5 min (anhydrous substance) (Lit.)

Persistence and degradability

Biodegradability

Not readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water
log Pow: -1.38
(experimental)
(anhydrous substance) Bioaccumulation is not expected (log Pow <1).

Mobility in soil

No information available.

Other adverse effects

Additional ecological information
Biological effects:
Harmful effect due to pH shift.
Forms toxic mixtures in water, dilution measures notwithstanding.
Further information on ecology
Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number	UN 2672
Proper shipping name	AMMONIA SOLUTION
Class	8
Packing group	III
Environmentally hazardous	--

Air transport (IATA)

UN number	UN 2672
Proper shipping name	AMMONIA SOLUTION
Class	8
Packing group	III
Environmentally hazardous	--
Special precautions for user	no

Sea transport (IMDG)

UN number	UN 2672
Proper shipping name	AMMONIA SOLUTION
Class	8
Packing group	III
Environmentally hazardous	--
Special precautions for user	yes
EmS	F-A S-B

SECTION 15. Regulatory information

United States of America

OSHA Hazards

Corrosive to skin
Corrosive to eyes
Respiratory irritant

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

SARA 311/312 Hazards

Acute Health Hazard

US State Regulations

Massachusetts Right To Know

Ingredients

$[^2H_4)$ammonium-$[^2H]$hydroxide

Pennsylvania Right To Know

Ingredients
deuterium oxide
$[^2H_4]$ammonium-$[^2H]$hydroxide

New Jersey Right To Know

Ingredients
deuterium oxide
$[^2H_4]$ammonium-$[^2H]$hydroxide

California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

TSCA:	Not Listed on TSCA inventory. For Research and Development Use only. Not For Manufacturing or Commercial Purposes.
DSL:	This product contains one or several components that are not on the Canadian DSL nor NDSL.

SECTION 16. Other information

Details in analogy to the undeuterated compound.

Training advice
Provide adequate information, instruction and training for operators.

Full text of H-Statements referred to under sections 2 and 3.

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.

Key or legend to abbreviations and acronyms used in the safety data sheet
Used abbreviations and acronyms can be looked up at www.wikipedia.org.

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