

## GHS Classification

**ID564**

**Ammonia**

**CAS 7664-41-7**

Date Classified: Apr. 20, 2006 (Environmental Hazards: Mar. 31, 2006)

**Physical Hazards**

Reference Manual: GHS Classification Manual (Feb. 10, 2006)

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Explosives	Not applicable	-	-	-	Gas (GHS definition)
2 Flammable gases	Category 1	-	Danger	Extremely flammable gas	Flammable range with air is 15-28 vol% (GESTIS-database on hazardous substances, 2nd, 1993)
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Not classified	-	-	-	UNRTDG No.1005, Class: 2.3, Subsidiary risks Class: 8
5 Gases under pressure	Liquefied gas	Gas cylinder	Warning	Contains gas under pressure; may explode if heated	Critical temp: 132.4degC (Merck, 13th, 2001)
6 Flammable liquids	Not applicable	-	-	-	Gas (GHS definition)
7 Flammable solids	Not applicable	-	-	-	Gas (GHS definition)
8 Self-reactive substances and mixtures	Not applicable	-	-	-	Gas (GHS definition)
9 Pyrophoric liquids	Not applicable	-	-	-	Gas (GHS definition)
10 Pyrophoric solids	Not applicable	-	-	-	Gas (GHS definition)
11 Self-heating substances and mixtures	Not applicable	-	-	-	Gas (GHS definition)
12 Substances and mixtures, which in contact with water, emit flammable gases	Not applicable	-	-	-	Gas (GHS definition)
13 Oxidizing liquids	Not applicable	-	-	-	Gas (GHS definition)
14 Oxidizing solids	Not applicable	-	-	-	Gas (GHS definition)
15 Organic peroxides	Not applicable	-	-	-	Gas (GHS definition)
16 Corrosive to metals	Classification not possible	-	-	-	Test methods applicable to gas substances are not available

**Health Hazards**

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Classification not possible	-	-	-	There is the report of the death in humans after ammonia solution ingestion (EHC 54 (1986)). But it is not gas data, it is not considered as the basis of the categories.
1 Acute toxicity (dermal)	Classification not possible	-	-	-	Classification not possible due to lack of data
1 Acute toxicity (inhalation: gas)	Category 4	Exclamation mark	Warning	Harmful if inhaled	It was considered as Category 4 based on rat LC50 = 4608.7ppm (4-hour equivalent) (EHC 54 (1986)).
1 Acute toxicity (inhalation: dust, mist)	Not applicable	-	-	-	Gas (GHS definition)
2 Skin corrosion / irritation	Category 1A-1C	Corrosion	Danger	Causes severe skin burns and eye damage	Necrosis was observed in skin irritation test with ammonia solution on rabbits (IUCLID 2000). As for humans, there is a report of a remarkable stimulation, chemical burns, etc. on contacts with ammonia gas (DFGOTvol.6 (1992)), and it is regarded as a skin irritant also in the state of gas (IUCLID 2000). From what mentioned above, it was classified as Category 1A-1C.
3 Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	Conjunctival edema is observed ammonia postexposure to eye of rabbit (EHC 54 (1986)). If a burned is caused, the irreversible influence of eyeball adhesion, the ulcers and perforations of a cornea, permanent corneal cloudings, iritis, etc. is admitted (EHC 54 (1986), IUCLID (2000)). Furthermore, humans also had affect by contact directly for a rapid rates, and the eye disorders especially critical in high concentrations has occurred (EHC 54 (1986), ACGIH (7th, 2001)). It was set as Category 1 based on the above fact.
4 Respiratory/skin sensitization	Respiratory sensitization: Category 1; Skin sensitization: Not classified	(Respiratory sensitization)Health hazard; (Skin sensitization)-	(Respiratory sensitization)Danger; (Skin sensitization)-	(Respiratory sensitization)May cause allergy or asthma symptoms or breathing difficulties if inhaled; (Skin sensitization)-	[Respiratory sensitization] Two or more asthma or asthma-like symptoms by ammonia exposures have been reported by humans (ATSDR 2004, ACGIH (2001)). Based on the fact that a statistically significant relevance is indicated between ammonia gas exposure and the respiratory symptom including bronchial asthma by one report (ATSDR 2004) and that in a different report ammonia is made the asthmatic cause by the provocation test (ATSDR 2004), it was referred to as Category 1. [Skin sensitization] Although there is no animal test data of NH3 itself, as it is in a form of gas at an ordinary temperature and normal pressure, its examination in solution is being carried out. As skin sensitization was clearly denied by the Open epicutaneous test using a guinea pigs (IUCLID 2000, it was put outside of the Category.

5	Germ cell mutagenicity	Category 2	Health hazard	Warning	Suspected of causing genetic defects (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)	The substance was classified as Category 2. Because there are increases in chromosome aberration and sister chromatid exchange in the study/analysis of the blood samples taken from people who have been exposed to ammonia and people who have not (ATSDR 2004), and there is a positive result from the in vivo mutagenicity test (the micronucleus test in mice: ATSDR (2004)).
6	Carcinogenicity	Classification not possible	-	-	-	There is no finding which suggests carcinogenicity as a result of mixing ammonia in drinking water and administration to mice for two years (EHC 54 (1986)), but there is also a description of tumors in the stomach and intestines (details unknown) (RTECS (2004)). Information is still more nearly need for a classification and it determined that "It cannot be classified."
7	Toxic to reproduction	Classification not possible	-	-	-	There is only the description of decrease weight gain of 120-day old child in administration for pregnant and lactational period (ATSDR (2004)), but it is not obvious on the effect to reproductive potential in administration before pregnancy (prematng), and so it cannot be classified since data is insufficient
8	Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory)	Health hazard	Danger	Cause damage to organs (respiratory)	Since difficulty breathing, lung edema, bronchial pneumonias, etc. are reported in humans (DFGOTvol.6 (1992), ATSDR (2004), IRIS (1991), BSDB (2005)), and significant toxicity effects to the respiratory systems containing lungs, such as dyspnea, cyanosis, haemorrhage lung and pulmonary edema, interstitial pneumonias, etc. are observed also in animal studies (EHC 54 (1986)), it was classified into Category 1 (respiratory systems). In addition, the toxic expressing levels presumed from animal data (EHC 54 (1986)) is also equivalent to the guidance value Category 1.
9	Specific target organs/systemic toxicity following repeated exposure	Category 2 (lung)	Health hazard	Warning	May cause damage to organs (lung) through prolonged or repeated exposure	In repeated inhalation study of rats, the interstitial pneumonias accompanied by a peribronchitis is seen in the range of the guidance value of Category 2 (EHC 54 (1986)), and the same clinical features as a contractile lung functional disorder, an obstructive pulmonary disease, etc. with chronic dyspnea is reported in humans who received occupational exposure of ammonia in large quantities (IUCILID (2000)). It was classified in Category 2 (lung) based on these facts. In addition, influence on lungs are seen in other animals, or in other examinations from which a test condition differs (EHC 54 (1986), IUCILID 2000).
10	Aspiration hazard	Not applicable	-	-	-	Gas (GHS definition)

### Environmental Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
11 Hazardous to the aquatic environment (acute)	Category 1	Environment	Warning	Very toxic to aquatic life	It was classified into Category 1 from 96-hour LC50=0.083mg NH3/L of fishes (Pink salmon) (EHC54, 1986).
11 Hazardous to the aquatic environment (chronic)	Category 1	Environment	Warning	Very toxic to aquatic life with long lasting effects	Classified into Category 1, since acute toxicity was Category 1, and behavior in water and bioaccumulative potential are unknown.