N,N-Dimethylacetamide

sc-250514

Material Safety Data Sheet

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
N,N-Dimethylacetamide

STATEMENT OF HAZARDOUS NATURE
CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA

SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800
EMERGENCY:
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS
C4-H9-N-O, CH3CON(CH3)2, "dimethyl acetamide", DMA, DMAC, "acetic acid, dimethylamide", acetdimethylamide, "dimethylacetone amide", "dimethylamide acetate", hallucinogen, acetyldimethylamide, Me2-N-Ac

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	1		
Toxicity:	2		
Body Contact:	2		
Reactivity:	1		
Chronic:	3		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW

RISK

Irritating to eyes.
May cause harm to the unborn child.
HARMFUL - May cause lung damage if swallowed.
Harmful by inhalation and in contact with skin.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result. (ICSC13733).
■ Accidental ingestion of the material may be damaging to the health of the individual.
■ When N,N-dimethylacetamide (DMAc) given to humans in daily doses (400 mg/kg for 3 days - route(?)), depression, lethargy, confusion and disorientation ensued.
In some patients there were visual and auditory hallucinations, perceptual distortions, delusions, emotional detachment and effective blunting, all reminiscent of the reactions induced by mescaline and by lysergic acid derivatives.
■ Considered an unlikely route of entry in commercial/industrial environments.
The liquid may produce gastrointestinal discomfort and may be harmful if swallowed.

EYE

■ Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals.
Prolonged eye contact may cause inflammation characterized by a temporary redness of the conjunctiva (similar to windburn).

SKIN

■ Skin contact with the material may be harmful; systemic effects may resultfollowing absorption.
■ The material is not thought to be a skin irritant (as classified using animal models).
Temporary discomfort, however, may result from prolonged dermal exposures.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.
■ The material is not thought to produce respiratory irritation (as classified using animal models).
Nevertheless inhalation of vapors, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
■ Inhalation of N,N-dimethylacetamide (DMAc) may cause headache, nausea, vomiting, intolerance to alcohol, abdominal spasm and diarrhoea.
Large doses can result in depression, lethargy, disorientation, and visual and auditory hallucinations.

CHRONIC HEALTH EFFECTS

■ Ample evidence exists, from results in experimentation, that developmental disorders are directly caused by human exposure to the material.
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
Repeated exposure of 20 to 25 ppm N,N-dimethylacetamide (DMAc) (due to appreciable skin absorption) has caused jaundice in workers; evidence of liver damage and hepatic dysfunction is clear.
Workers exposed to DMAc for 2-10 years showed abnormal liver function.
Chronic exposure can result in cumulative liver and kidney damage. (Repeated dermal application of the liquid to dogs caused severe fatty infiltration of the liver; repeated exposure of rats to the vapour
resulted in focal necrosis of the liver.)
Teratogenic effects from dermal application were reported in rats when DMAc was applied on gestation days 10 and 11 at a total does of 2400 mg/kg body weight.
When DMAc was administered to rats by gavage at a dosage of 400 mg/kg/day on days 6 through 19 of gestation, malformations of the heart, major blood vessels and oral cavity were seen. Maternal toxicity and post-implantation loss were also seen at this dose.
Some evidence exists that a demethylation metabolite, acetamide, is a rat liver carcinogen.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%

N,N-dimethylacetamide	127-19-5	>95

Section 4 - FIRST AID MEASURES

SWALLOWED
· If swallowed do NOT induce vomiting. · If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. · If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

EYE
■ If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN
■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

INHALED
· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN
■ Any material aspirated during vomiting may produce lung injury. Therefore emesis should not be induced mechanically or pharmacologically.
Treat symptomatically.
for poisons (where specific treatment regime is absent):
----------BASIC TREATMENT

· Establish a patent airway with suction where necessary.
· Watch for signs of respiratory insufficiency and assist ventilation as necessary.

Section 5 - FIRE FIGHTING MEASURES

Vapor Pressure (mmHg):	1.995 @ 25 C
Upper Explosive Limit (%):	11.5 @ 160 C
Specific Gravity (water=1):	0.95 @ 20 C
Lower Explosive Limit (%):	1.8 @ 100 C

EXTINGUISHING MEDIA
· Alcohol stable foam.
· Water spray or fog.
· Foam.

FIRE FIGHTING
· Alert Emergency Responders and tell them location and nature of hazard.
· Wear full body protective clothing with breathing apparatus.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS
· Combustible.
· Slight fire hazard when exposed to heat or flame.
Combustion products include: carbon dioxide (CO2), nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.
May emit poisonous fumes.
May emit corrosive fumes.
Thermal-oxidative degradation products may include dimethylamine.

FIRE INCOMPATIBILITY
■ Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids,chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION
Glasses:
Safety Glasses.
Chemical goggles.
Gloves:
1.BUTYL 2.SARANEX-2 3.PVA
Respirator:
Type A Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

· Remove all ignition sources.
· Clean up all spills immediately.
MAJOR SPILLS
■ Moderate hazard.
· Clear area of personnel and move upwind.
· Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of exposure occurs.

RECOMMENDED STORAGE METHODS
· Metal can or drum
· Packing as recommended by manufacturer.

STORAGE REQUIREMENTS
· Store in original containers.
· Keep containers securely sealed.
· No smoking, naked lights or ignition sources.
· Store in a cool, dry, well-ventilated area.
· Store away from incompatible materials and foodstuff containers.
· Protect containers against physical damage and check regularly for leaks.
· Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
Canada - Alberta Occupational Exposure Limits	N,N-dimethylacetamide (N,N-Dimethylacetamide)	10	36						
Canada - British Columbia Occupational Exposure Limits	N,N-dimethylacetamide (N,N-Dimethylacetamide)	10							Skin; R
US NIOSH Recommended Exposure Limits (RELs)	N,N-dimethylacetamide (Dimethyl acetamide)	10	35						[skin]
US OSHA Permissible Exposure Levels (PELs) - Table Z1	N,N-dimethylacetamide (Dimethyl acetamide)	10	35						
US ACGIH Threshold Limit Values (TLV)	N,N-dimethylacetamide (N,N-Dimethylacetamide)	10							TLV Basis: liver damage; embryo/fetal damage. BEI
US - Minnesota Permissible Exposure Limits (PELs)	N,N-dimethylacetamide (Dimethyl acetamide)	10	35						
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional	N,N-dimethylacetamide (Dimethyl acetamide)	10	35						

Limits for Air Contaminants							
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	N,N-dimethylacetamide (Dimethyl acetamide)	10	35				
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	N,N-dimethylacetamide (Dimethyl acetamide)	10	35				
US - California Permissible Exposure Limits for Chemical Contaminants	N,N-dimethylacetamide (Dimethylacetamide)	10	35				
US - Idaho - Limits for Air Contaminants	N,N-dimethylacetamide (Dimethyl acetamide)	10	35				
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	N,N-dimethylacetamide (N,N-Dimethylacetamide)	10	36				
US - Hawaii Air Contaminant Limits	N,N-dimethylacetamide (Dimethyl acetamide)	10	35	15	50		
US - Alaska Limits for Air Contaminants	N,N-dimethylacetamide (Dimethylacetamide)	10	35				
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	N,N-dimethylacetamide (N,N-Dimethylacetamide)	10		15			Skin
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	N,N-dimethylacetamide (Dimethyl acetamide - Skin)	10	35	15	50		
US - Washington Permissible exposure limits of air contaminants	N,N-dimethylacetamide (Dimethyl acetamide)	10		20			
US - Michigan Exposure Limits for Air Contaminants	N,N-dimethylacetamide (Dimethyl acetamide)	10	35				
Canada - Prince Edward Island Occupational Exposure Limits	N,N-dimethylacetamide (N,N-Dimethylacetamide)	10					TLV Basis: liver damage; embryo/fetal

						damage. BEI
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	N,N-dimethylacetamide (Dimethyl acetamide)	10	35			
Canada - Nova Scotia Occupational Exposure Limits	N,N-dimethylacetamide (N,N-Dimethylacetamide)	10				TLV Basis: liver damage; embryo/fetal damage. BEI
US - Oregon Permissible Exposure Limits (Z-1)	N,N-dimethylacetamide (Dimethyl acetamide)	10	35			
Canada - Northwest Territories Occupational Exposure Limits (English)	N,N-dimethylacetamide (Dimethyl acetamide - Skin)	10	36	15	53	

ENDOELTABLE

PERSONAL PROTECTION




RESPIRATOR

•Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

EYE

· Safety glasses with side shields.
· Chemical goggles.

HANDS/FEET

■ Wear chemical protective gloves, eg. PVC.
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity
Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).
· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
· Contaminated gloves should be replaced.
Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
· Aprotic solvents may greatly promote the toxic properties of solutes because of their unique ability to penetrate synthetic rubber protective gloves and the skin (butyl rubber gloves are reported to be more satisfactory than others.

OTHER

· Overalls.
· P.V.C. apron.
· Barrier cream.
· Skin cleansing cream.
· Eye wash unit.

ENGINEERING CONTROLS

■ Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.
Mixes with water.

State	Liquid	Molecular Weight	87.12
Melting Range (°F)	-4	Viscosity	1.02 cSt@40°C
Boiling Range (°F)	327- 331	Solubility in water (g/L)	Miscible
Flash Point (°F)	158	pH (1% solution)	Not available
Decomposition Temp (°F)	662	pH (as supplied)	Not applicable
Autoignition Temp (°F)	914	Vapor Pressure (mmHg)	1.995 @ 25 C
Upper Explosive Limit (%)	11.5 @ 160 C	Specific Gravity (water=1)	0.95 @ 20 C
Lower Explosive Limit (%)	1.8 @ 100 C	Relative Vapor Density (air=1)	3.0
Volatile Component (%vol)	100	Evaporation Rate	Not available

N,N-dimethylacetamide

log Kow (Sangster 1997): -0.77

APPEARANCE

Colourless liquid with a faint ,ammonia-like odour. Miscible in water. Mildly hygroscopic. Viscosity: 0.92 mPa sec @ 25 C.

log Kow -0.77 The results of the Level III Fugacity modelling indicate that if the chemical is released equally to the three major environmental compartments (air, water, and soil), it will mainly partition into water and soil, where the chemical has not been indicated to persist. If released to air, the Level III Fugacity model indicates a limited amount of the substance remains in air. An experimental vapour pressure of 174-267 Pa and Henry's Law constant of 1.33×10-3 Pa·m3/mol indicate that DMC can be highly volatile, but is unlikely to volatilise from water. Therefore, if released solely to air, little will remain in air (<1%) with the majority partitioning to soil and water (~99%). If released into water, DMAC is expected to weakly adsorb to suspended solids and sediment based upon a very low value of estimated log Koc of 0.97 and an experimental log Kow value of -0.77. Volatilisation from water surfaces is expected to be an unimportant fate process based upon this compound's estimated Henry's Law constant. Thus, if water is a receiving medium, DMAC is expected to mainly remain in water. If released to soil, DMAC is expected to have very low adsorptivity to soil (i.e. expected to be mobile) based upon estimated log Koc and log Kow values. Volatilisation from moist soil surfaces seems to be an unimportant fate process based upon an estimated Henry's Law constant. This chemical may however rapidly volatilize from dry soil surfaces based upon its vapour pressure. Therefore, if released to soil, DMAC will mainly remain in this environmental compartment, which can be illustrated by the results of the Level III fugacity modelling. Potential for Bioaccumulation Experimental and modelled logKow values suggest that DMAC does not have potential to bioaccumulate in the environment. Since no experimental data on bioaccumulation (BAF) or bioconcentration (BCF) of DMAc were available, a QSAR-based weight-of-evidence approach (Environment Canada 2007) was applied using the BAF and BCF models. The Modified GOBAS BAF middle trophic level model for fish predicted a Bioaccumulation Factor (BAF) of 1.00 L/kg, indicating that DMAC does not have the potential to bioconcentrate and biomagnify in the environment. Three BCF models also provide a weight-of-evidence to support the low bioconcentration potential of this substance. The weight of evidence indicates that DMAC does not meets the bioaccumulation criterion (BCF, BAF > 5000) as set out in the Persistence and Bioaccumulation Regulations (Government of Canada 2000).

Material	Value

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

· Presence of incompatible materials.
· Product is considered stable.
Presence of impurities in trace (catalytic) amounts may decrease stability or increase reactivity.

STORAGE INCOMPATIBILITY

· Many aprotic (non-hydroxylic) solvents are not inert towards other reagents and care must be taken when using untried combinations of solvents an reagents for the first time.
· Some aprotic solvents have a dramatic effect on reaction rates.
N,N-dimethylacetamide (DMAc):
· reacts violently with strong oxidisers and halogenated compounds (eg. CCl4, benzene hexachloride), particularly in the presence of iron.
· is incompatible with mineral acids, strong acids, ammonia, isocyanates, phenols, cresols
· is corrosive when dissolved in water
· attacks plastics, rubber and coatings.
Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

N,N-dimethylacetamide

TOXICITY AND IRRITATION

N,N-DIMETHYLACETAMIDE:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (rat) LD50: 5000 mg/kg	Skin (rabbit):10 mg/24h(open)-Mild
Oral (human) LDLo: 500 mg/kg	
Inhalation (human) TCLo: 20 ppm	
Inhalation (mammal) LCLo: 406 ppm	
Dermal (rabbit) LD50: 2240 mg/kg	

■ The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

WARNING: Avoid the exposure of pregnant women to this substance. Females of child-bearing potential should avoid airborne exposure above the TLV and avoid skin contact. Animal experiments indicate embryotoxic and teratogenic (congenital malformation of the fetus) effects. The potential toxic properties of any amide should be carefully considered before use or exposure commences.

N,N-dimethylacetamide (DMAC) is well-absorbed orally, by inhalation and percutaneously . It has a low acute toxicity by all routes of exposure. Direct application of the liquid results in "very slight" skin irritation and mild to moderate eye irritation.

The critical effects of DMAC are respiratory tract irritation and hepatotoxicity. Repeated exposure to 40 ppm (145 mg/m3) DMAC, six hours/day, five days/week for six months, produced only marginal histopathological evidence of lung irritation in rats and dogs . At 100 ppm (362 mg/m3) and above, there was significant dose-dependent toxicity, with nasal and upper respiratory tract irritation or inflammation and liver damage as the predominant findings. Hepatotoxicity has also been reported in rats exposed to 288 ppm (1043 mg/m3) DMAC, six hours/day, five days/week for two weeks. Effects on the blood, bone marrow and testes were observed at high exposures.

DMAC was not genotoxic in a limited range of in vitro and in vivo studies. No evidence of carcinogenicity was observed in the single inadequate gavage study available. Reproductive toxicity has not been observed in inhalation studies at levels which do not cause maternal toxicity.

The ACGIH documentation of the TLV for DMAC contains the statement: "Jaundice has been observed to result in workers exposed repeatedly at from 20 to 25 ppm DMAc, but appreciable skin penetration undoubtedly contributed to this effect" (ACGIH 1986-1987).

DMAC is well-absorbed orally, by inhalation and dermally. There are adequate data with which to evaluate the potential hazard to human health of this compound. DMAC has low toxicity by ingestion: the oral LD 50 ranges from 3000 mg/kg bw to 6000 mg/ kg in rats and > 5000 mg/Kg bw in rabbits. The chemical is harmful by dermal route and inhalation: dermal LD 50 values were 7500 mg/kg bw in rats, 9600 mg/Kg bw in mice, from 2100 mg/kg bw to 3600 mg/Kg bw in rabbits, but less than 940 mg/ kg bw in guinea pig. Inhalation LC 50 rat was 8.81 mg/l, 1h (~2.2 mg/l, 4h) and LC 50 mouse was 1.47 mg/l, 3.5 h. DMAC is not a skin sensitiser or skin irritant and was only slightly irritating to the eyes. In repeated dose studies (14 days to 2 years) NOAECs of 25 ppm (0.09 mg/l) and higher have been observed in inhalation studies with rats and mice. Effects observed included liver degeneration, some irritation to the respiratory tract and decreased body weight gain. A NOAEL oral of 300 mg/Kg, 24 months, has been observed in oral studies with rats. Observation included kidney and adrenal weights. DMAC does not show mutagenic effects in several in vitro and in vivo tests. UDS in human diploide fibroblast and a transgenic mouse mutation assay on liver tissue are negative. For the in vivo tests two dominant lethal assays with rat (dermal and inhalation) were negative and dominant lethal assays on mouse (dermal, inhalation and i.p.) were negative too.

A cytogenetic assay on human lymphocytes from 20 workers who were in contact with DMAC didn't reveal an increase in the frequency of chromosome aberration. DMAC was not carcinogenic in a two year drinking water study and a two year inhalation study in rats and to an 18 months inhalation study in mice. DMAC has been extensively studied for reproductive toxicity properties. Fertility was not affected when male rats had been exposed to up to 386 ppm (1.4 mg/l) in a 43 days inhalation study and in a 10 weeks one-generation inhalation study up to 300 ppm (1.08 mg/l) (females also were exposed). No effects in mice were observed in a sperm abnormalities test with exposures up to 700 ppm (2.52mg/l)for 6 weeks. Developmental toxicity was also investigated: the inhalation study in rats showed no adverse effects at the highest concentration, 300 ppm (1.08 mg/l), other than reduced maternal and fetal weight. The rabbit inhalation study showed a small increase in cardiac malformations at 570 ppm (2.052mg/l), in absence of maternal toxicity signs. The oral studies (rat and rabbit) indicate that high doses can cause both maternal and embryofetal toxicity. In an oral study on rat at 65, 160, 400 mg/kg bw/day the highest dose of DMAC was able to induce specific teratogenic effects such as great vessel malformations and anasarca at maternal toxic levels and the NOEL is 160 m g/kg bw/day. These findings were confirmed by a second oral study on rat performed at the same dose levels, from which a NOEL of 65-mg/kg bw/day can be derived. Due to the observed signs of specific developmental toxicity DMAC has to be considered a developmental toxicant. Effects seen in the dermal studies (rat and rabbit) occurred at high and generally maternotoxic doses. An in vitro embryotoxicity study has been performed and embryotoxicity and teratogenic effects were observed at the highest levels. A NOEC was derived, corresponding to an in vivo NOEL of 100 ppm as the concentration in the plasma after the exposure to 100 ppm in air in another study, may be similar to the NOEL observed in this study.

Liver impairment was observed in 19 out of 41 workers who had been working from 2 to 10 years in a spinning unit (airborne levels were not reported). Upper respiratory tract, gastric and nervous disturbances were complained.

Biological monitoring of workers exposed to DMAC in an acrylic fibre plant was performed: brief threshold limit value-level exposures and chronic low level exposure do not cause hepatotoxic clinical chemistry responses. A retrospective epidemiologic study was undertaken in 571 workers with a 12-months simultaneous exposure to acrylonitrile and no relationship between tumors and DMAC exposure was found. Also dermal absorption and inhalation of DMAC in human volunteers was carried out. They were exposed twice to

DMAC for 4 h at intervals of 96 h or above to 6.1 ppm). Mean dermal absorption was estimated to be 40.4% of the total DMAC uptake. DMAC vapour was significantly absorbed through the skin. Biological half lives of urinary MMAC were 9h for skin and 5.6 h for lung respectively.
Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

CARCINOGEN

N,N-Dimethylacetamide	US ACGIH Threshold Limit Values (TLV) - Carcinogens	Carcinogen Category	A4
N,N-dimethylacetamide	US - Rhode Island Hazardous Substance List	IARC	
TWAPPM~	US - Maine Chemicals of High Concern List	Carcinogen	A4

SKIN

N,N-dimethylacetamide	US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants - Skin	Skin Designation	X
N,N-dimethylacetamide	US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants - Skin	Skin Designation	X
N,N-dimethylacetamide	US - Washington Permissible exposure limits of air contaminants - Skin	Skin	X
N,N-dimethylacetamide	US ACGIH Threshold Limit Values (TLV) - Skin	Skin Designation	Yes
N,N-dimethylacetamide	US AIHA Workplace Environmental Exposure Levels (WEELs) - Skin	Notes	TLV Basis: liver damage; embryo/fetal damage. BEI
N,N-dimethylacetamide	US NIOSH Recommended Exposure Limits (RELs) - Skin	Skin	Yes
N,N-dimethylacetamide	US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Skin	Skin	X
N,N-dimethylacetamide	US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs) - Skin	Skin	X
N,N-dimethylacetamide	US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants - Skin	Skin Designation	X
N,N-dimethylacetamide	Canada - British Columbia Occupational Exposure Limits - Skin	Notation	Skin; R
N,N-dimethylacetamide	US - Minnesota Permissible Exposure Limits (PELs) - Skin	Skin Designation	X
N,N-dimethylacetamide	US - Hawaii Air Contaminant Limits - Skin Designation	Skin Designation	X
N,N-dimethylacetamide	US OSHA Permissible Exposure Levels (PELs) - Skin	Skin Designation	X
N,N-dimethylacetamide	US - Oregon Permissible Exposure Limits (Z2) - Skin	Skin	X
N,N-dimethylacetamide	US - California Permissible Exposure Limits for Chemical Contaminants - Skin	Skin	X
N,N-dimethylacetamide	US - California Permissible Exposure Limits for Chemical Contaminants - Skin	Skin	S
N,N-dimethylacetamide	Canada - Alberta Occupational Exposure Limits - Skin	Substance Interaction	1

Section 12 - ECOLOGICAL INFORMATION

No data

GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles

Name / EHS TRN A1a A1b A1 A2 B1 B2 C1 C2 C3 D1 D2 D3 E1 E2 E3 Cas No / RTECS No _____ Dimethyl 658 273 0 0 R 1 NI 0 0 2 1 2 D 2 acetamide 0 / CAS:127- 19- 5 /

Legend: EHS=EHS Number (EHS=GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships) NRT=Net Register Tonnage, A1a=Bioaccumulation log Pow, A1b=Bioaccumulation BCF, A1=Bioaccumulation, A2=Biodegradation, B1=Acuteaquatic toxicity LC/ECIC50 (mg/l), B2=Chronic aquatic toxicity NOEC (mg/l), C1=Acute mammalian oral toxicity LD50 (mg/kg), C2=Acutemammalian dermal toxicity LD50 (mg/kg), C3=Acute mammalian inhalation toxicity LC50 (mg/kg), D1=Skin irritation & corrosion, D2=Eye irritation& corrosion, D3=Long-term health effects, E1=Tainting, E2=Physical effects on wildlife & benthic habitats, E3=Interference with coastal amenities, For column A2: R=Readily biodegradable, NR=Not readily biodegradable. For column D3: C=Carcinogen, M=Mutagenic, R=Reprotoxic, S=Sensitising, A=Aspiration hazard, T=Target organ systemic toxicity, L=Lunginjury, N=Neurotoxic, I=Immunotoxic. For column E1: NT=Not tainting (tested), T=Tainting test positive. For column E2: Fp=Persistent floater, F=Floater, S=Sinking substances. The numerical scales start from 0 (no hazard), while higher numbers reflect increasing hazard. (GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships)

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.
¦ Puncture containers to prevent re-use and bury at an authorized landfill.
Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:
· Reduction
· Reuse
· Recycling
· Disposal (if all else fails)
This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.
· Recycle wherever possible or consult manufacturer for recycling options.
· Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

Section 15 - REGULATORY INFORMATION

N,N-dimethylacetamide (CAS: 127-19-5) is found on the following regulatory lists;

"Canada - Alberta Occupational Exposure Limits","Canada - British Columbia Occupational Exposure Limits","Canada - Northwest Territories Occupational Exposure Limits (English)","Canada - Nova Scotia Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits - Carcinogens","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada Ingredient Disclosure List (SOR/88-64)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 17: Summary of minimum requirements","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk","International Chemical Secretariat (ChemSec) REACH SIN* List (*Substitute It Now!) 1.1","US - Alaska Limits for Air Contaminants","US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List","US - California Permissible Exposure Limits for Chemical Contaminants","US - California Proposition 65 - Reproductive Toxicity","US - Connecticut Hazardous Air Pollutants","US - Hawaii Air Contaminant Limits","US - Idaho - Limits for Air Contaminants","US - Massachusetts Oil & Hazardous Material List","US - Michigan Exposure Limits for Air Contaminants","US - Minnesota Hazardous Substance List","US - Minnesota Permissible Exposure Limits (PELs)","US - New Jersey Right to Know Hazardous Substances","US - Oregon Permissible Exposure Limits (Z-1)","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants","US - Washington Permissible exposure limits of air contaminants","US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants","US ACGIH Threshold Limit

Values (TLV)","US ACGIH Threshold Limit Values (TLV) - Carcinogens","US DOE Temporary Emergency Exposure Limits (TEELs)","US EPA High Production Volume Program Chemical List","US EPA Master Testing List - Index I Chemicals Listed","US NIOSH Recommended Exposure Limits (RELs)","US OSHA Permissible Exposure Levels (PELs) - Table Z1","US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory","US TSCA Section 12(b) - List of Chemical Substances Subject to Export Notification Requirements","US TSCA Section 4/12 (b) - Sunset Date/Status","US TSCA Section 8 (a) - Preliminary Assessment Information Rules (PAIR) - Reporting List","US TSCA Section 8 (d) - Health and Safety Data Reporting"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

■ Ingestion may produce health damage*.
■ Cumulative effects may result following exposure*.
* (limited evidence).

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■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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