Material Safety Data Sheet
Hydrazine hydrate, 55% (Hydrazine, 35%)

ACC# 14707

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydrazine hydrate, 55% (Hydrazine, 35%)
Catalog Numbers: AC296810000, AC296810050, AC296815000
Synonyms: None.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	65	231-791-2
302-01-2	Hydrazine	35	206-114-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless waxy solid.
Danger! May be fatal if absorbed through the skin. Harmful if inhaled. Causes eye, skin, and respiratory tract irritation. Harmful if swallowed. May cause blood abnormalities. Cancer suspect agent. Air sensitive. May cause liver and kidney damage. This substance has caused adverse reproductive and fetal effects in animals.
Target Organs: Blood, kidneys, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: May cause irreversible eye injury. Exposure to the vapors or liquid may cause temporary blindness. Causes severe eye irritation and burns.
Skin: May be fatal if absorbed through the skin. Prolonged and/or repeated contact may cause irritation and/or dermatitis. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Contact with liquid is corrosive and causes severe burns and ulceration. Contact with the skin may dissolve hair.
Ingestion: Harmful if swallowed. May cause liver and kidney damage. Exposure may cause anemia and other blood abnormalities.
Inhalation: Harmful if inhaled. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). May cause liver and kidney damage. May cause lung damage. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Vapors may cause dizziness, nausea, itching, burning, and swelling of the eyes. May cause respiratory sensitization.
Chronic: Repeated inhalation may cause chronic bronchitis. May cause cancer according to animal studies. Repeated exposure may cause sensitization dermatitis. Chronic exposure may lead to liver and lung damage. May cause reproductive and fetal effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid imme diately. Do NOT allow victim to rub eyes or keep eyes closed.
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Runoff from fire control or dilution water may cause pollution.
Extinguishing Media: Use water spray to cool fire-exposed containers. Use water spray, dry chemical, carbon dioxide, or chemical foam.
Flash Point: > 100 deg C (> 212.00 deg F)
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 2

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Do not flush into a sewer. Provide ventilation. Do not get water inside containers. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Store protected from light. Do not breathe vapor or mist.
Storage: Do not store in direct sunlight. Keep refrigerated. (Store below 4°C/39°F.) Store in a tightly closed container. Storage under a nitrogen blanket has been recommended.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
Hydrazine	0.01 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous r oute	50 ppm IDLH	1 ppm TWA; 1.3 mg/m3 TWA
Hydrazine hydrate	none listed	none listed	none listed

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Hydrazine: 0.1 ppm TWA; 0.1 mg/m3 TWA Hydrazine hydrate: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Waxy Solid
Appearance: colorless
Odor: strong odor - ammonia-like
pH: Not available.
Vapor Pressure: 14.4 mm Hg @ 25
Vapor Density: 1.1 @ 15C
Evaporation Rate: Not available.
Viscosity: 0.90
Boiling Point: 109 deg C
Freezing/Melting Point:-65 deg C
Decomposition Temperature: Not available.
Solubility: Miscible in water.
Specific Gravity/Density:1.0230
Molecular Formula:N2H4
Molecular Weight:32.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However becomes unstable if dehydrated. Air sensitive.
Conditions to Avoid: Light, ignition sources, temperatures above 150°C.
Incompatibilities with Other Materials: Oxidizing agents, acids, alkali metals, copper, glass, halogens, iron, nitric acid, nitrites, perchlorates, rubber, sodium hydroxide, zinc, potassium, hydrogen peroxide, sodium, lead, dinitrogen tetraoxide, molybdenum(IV) oxide, mercuric oxide, organic matter, metal salts, stannous chloride, 2,4-dinitrochlorobenzene, thiocyanates, rust, metal oxides.
Hazardous Decomposition Products: Oxides of nitrogen, ammonia and/or derivatives, hydrogen gas.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7732-18-5: ZC0110000
CAS# 302-01-2: MU7175000
CAS# 10217-52-4: MV4590000
LD50/LC50:

CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;
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CAS# 302-01-2:
Dermal, guinea pig: LD50 = 190 mg/kg;
Inhalation, mouse: LC50 = 252 ppm/4H;
Inhalation, mouse: LC50 = 1000 mg/m3/2H;
Inhalation, mouse: LC50 = 320 mg/m3/4H;
Inhalation, rat: LC50 = 570 ppm/4H;
Inhalation, rat: LC50 = 130 mg/m3/2H;
Oral, mouse: LD50 = 59 mg/kg;
Oral, mouse: LD50 = 59 mg/kg;
Oral, rat: LD50 = 60 mg/kg;
Oral, rat: LD50 = 60 mg/kg;
Skin, rabbit: LD50 = 91 mg/kg;
.

CAS# 10217-52-4:
Inhalation, rat: LC50 = 80 mg/m3;
Oral, mouse: LD50 = 83 mg/kg;
Oral, rabbit: LD50 = 55 mg/kg;
Oral, rat: LD50 = 129 mg/kg;
.

Carcinogenicity:
CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 302-01-2:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 1/1/88
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

CAS# 10217-52-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: This substance has shown a high tumor-generating potential in multiple studies. Hydrazine has been classified as carcinogenic in many rodent studies following long-term administration. The major target tissues include: liver, lungs, and respiratory tract. Please refer to Patty's Industrial Hygiene and Toxicology for specific information. Substance is listed by CA Proposition 65. IARC has determined that there is sufficient evidence of carcinogenicity to animals and inadequate evidence for humans.
Teratogenicity: Effects on Newborn: Viability index, subcutaneous-rat TDLo=80mg/kg Embryo or Fetus: Death and Fetotoxicity, inhalation-rat TCLo= 1mg/m3/24H. Specific Developmental Abnormalities: Central nervous system/Musculoskeletal/Urogenital, intraperitoneal-rat TDLo=30mg/kg.
Reproductive Effects: Post-implantation mortality, inhalation-rat TCLo=4mg/m3/2H. Maternal Effects: Ovaries/Fallopian tubes.Inhalation, ratTCLo=5ppm/6H; Paternal Effects: Testes/Sperm duct/Epididymis.Inhalation-hamster TCLo=1ppm/6H.
Mutagenicity: DNA Damage: hamster oral 15mg/kg, rat liver 3mmol/L. DNA Inhibition: mouse oral 200mg/kg, rat oral 60mg/kg. Unscheduled DNA Synthesis: hamster ovary 250ug/L, rat oral 60mg/kg, rat lung 250ug/L.Oncogenic Transformation: human liver 80ug/L, human cell types 35mg/L.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Rainbow trout (fresh water) 146ppm/0.5H (Lethal) Guppy (hard water): LC50 = 3.85mg/L/96H Guppy (soft water): LC50 = 0.61mg/L/96HBluegill sunfish: LC50 = 1.08mg/L/96H
Environmental: Biodegradation is not expected to be significant when large amounts of hydrazine are released due to the high microbial toxicity of hydrazine; at lower concentrations, however, hydrazine biodegradation could be important. Volatilization of hydrazine should not be important from moist soil surfaces given an estimated Henry's Law constant of 6.1X10-7 atm-cu m/mole, calculated from experimental values for vapor pressure and water solubility.
Physical: No information available.
Other: Bioconcentration in guppies was studied using a hydrazine concentration in water of 0.5 ug/g. After 96 hours, the concentration of hydrazine in guppies was about 144 ug/g. These values give a bioconcentration factor of 316. An estimated BCF value of 0.01 was calculated for hydrazine, using a measured log Kow of -2.07(2) and a recommended regression-derived equation. According to a classification scheme, these BCF values suggest that bioconcentration in aquatic organisms may be high, as for guppies; however, based on this compound's values for log Kow and water solubility, the potential f

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 302-01-2: waste number U133 (Reactive waste, Toxic waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	HYDRAZINE, AQUEOUS SOLUTION	HYDRAZINE, AQUEOUS SOLUTION

Hazard Class:	6.1	6.1(6.1)
UN Number:	UN3293	UN3293
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.
CAS# 302-01-2 is listed on the TSCA inventory.
CAS# 10217-52-4 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 302-01-2: 1 lb final RQ; 0.454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 302-01-2: 1000 lb TPQ

SARA Codes

CAS # 302-01-2: immediate, delayed, fire, reactive.

Section 313

This material contains Hydrazine (CAS# 302-01-2, 35%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 302-01-2 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
CAS# 302-01-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 10217-52-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

WARNING: This product contains Hydrazine, a chemical known to the state of California to cause cancer.
California No Significant Risk Level: CAS# 302-01-2: 0.04 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
R 43 May cause sensitization by skin contact.
R 45 May cause cancer.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardou s waste.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.
CAS# 302-01-2: 3
CAS# 10217-52-4: No information available.

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.
CAS# 302-01-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all

of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 302-01-2 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 7/02/1999
Revision #4 Date: 1/04/2005