Material Safety Data Sheet

Date Printed: 15/DEC/2004
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Version 1.5
According to 91/155/EEC

1 - Product and Company Information

Product Name	ACRYLONITRILE, STAB.
Product Number	01710
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
ACRYLONITRILE	107-13-1	203-466-5	608-003-00-4

Formula	C3H3N
Molecular Weight	53.06 AMU
Synonyms	Acritet * Acrylnitril (German, Dutch) * Acrylon * Acrylonitrile (ACGIH:OSHA) * Acrylonitrile monomer * Akrylonitril (Czech) * Akrylonitryl (Polish) * Carbacryl * Cianuro di vinile (Italian) * Cyanoethylene * Cyanure de vinyle (French) * ENT 54 * Fumigrain * Miller's fumigrain * Nitrile acrilico (Italian) * Nitrile acrylique (French) * Propenenitrile * 2-Propenenitrile * RCRA waste number U009 * TL 314 * VCN * Ventox * Vinyl cyanide * Vinylcyanide (OSHA) * Vinylkyanid (Czech)

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
May cause cancer. Highly flammable. Toxic by inhalation, in contact with skin and if swallowed. Risk of serious damage to eyes. May cause sensitization by skin contact. Irritating to respiratory system and skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Carc. Cat.2

4 - First Aid Measures

AFTER INHALATION
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION
If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS
Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.
Explosion Hazards: Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area. Shut off all sources of ignition.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING
Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Conditions of Storage: Keep tightly closed. Keep away from heat, sparks, and open flame.

SPECIAL REQUIREMENTS: Heat and light sensitive.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS
Safety shower and eye bath. Use nonsparking tools. Use only in a chemical fume hood.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	2 MG/M3
Poland		NDSCh	10 MG/M3
Poland		NDSP	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	4 mg/m3
		2 ppm

Remarks: HK

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	7 mg/m3
		3 ppm

Remarks: 4
Remarks: H,TRK,TRGS 901-9

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	4 mg/m3
		2 ppm

Remarks: HK

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level	4.5 mg/m3
		2 ppm

Remarks: H, K

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	4.5 mg/m3
		2 ppm

Remarks: H K M

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	4.4 mg/m3
		2 ppm

PERSONAL PROTECTIVE EQUIPMENT
Respiratory Protection: Government approved respirator.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance: Physical State: Clear liquid
Color: Colorless

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	77 - 78 °C	
MP/MP Range	-83 °C	
Flash Point	-5 °C	Method: closed cup
Flammability	N/A	

Autoignition Temp	481 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 3 % Upper: 17 %	
Vapor Pressure	86 mmHg	20 °C
SG/Density	0.806 g/cm3	
Partition Coefficient	Log Kow: 0.25	
Viscosity	0.34 Pas	25 °C
Vapor Density	1.83 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	27.3 mN/m	24 °C
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:Soluble. Other Solvents: ISOPROPANOL, ETHER, ACETONE BENZENE	

10 - Stability and Reactivity

STABILITY

Conditions to Avoid: Heat. May polymerize on exposure to light.
Materials to Avoid: Oxidizing agents Copper, Copper alloys.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: May occur

11 - Toxicological Information

RTECS NUMBER: AT5250000

ACUTE TOXICITY

LCLO
Inhalation
Man
1,000 mg/m3
1H
Remarks: Behavioral:Somnolence (general depressed activity).
Gastrointestinal:Hypermotility, diarrhea.
Gastrointestinal:Nausea or vomiting.

LDLO
Skin
Child
2015 mg/kg
Remarks: Behavioral:General anesthetic. Lungs, Thorax, or Respiration:Cyanosis. Gastrointestinal:Nausea or vomiting.

LD50
Oral
Rat
78 mg/kg
Remarks: Behavioral:Convulsions or effect on seizure threshold.

Lungs, Thorax, or Respiration:Dyspnea. Gastrointestinal:Changes in structure or function of salivary glands.

LC50
Inhalation
Rat
333 ppm
4H
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Behavioral:Tremor. Lungs, Thorax, or Respiration:Dyspnea.

LD50
Skin
Rat
148 mg/kg

LD50
Intraperitoneal
Rat
65 MG/KG

LD50
Subcutaneous
Rat
75 MG/KG
Remarks: Peripheral Nerve and Sensation:Spastic paralysis with or without sensory change. Behavioral:Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration:Cyanosis.

LD50
Oral
Mouse
27 mg/kg
Remarks: Behavioral:Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration:Dyspnea. Gastrointestinal:Changes in structure or function of salivary glands.

LD50
Intraperitoneal
Mouse
46 MG/KG
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Corneal damage. Behavioral:Ataxia. Lungs, Thorax, or Respiration:Dyspnea.

LD50
Subcutaneous
Mouse
25 MG/KG
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Other. Behavioral:Change in motor activity (specific assay). Gastrointestinal:Hypermotility, diarrhea.

LD50
Skin
Rabbit
63 mg/kg
Remarks: Behavioral:Somnolence (general depressed activity). Skin and Appendages:Skin: After systemic exposure: Dermatitis, other

LD50
Intravenous
Rabbit
69 MG/KG
Remarks: Peripheral Nerve and Sensation:Flaccid paralysis with appropriate anesthesia. Behavioral:Tremor. Behavioral:Convulsions or effect on seizure threshold.

LD50
Oral
Guinea pig
50 mg/kg

LD50
Skin
Guinea pig
202 mg/kg

LD50
Subcutaneous
Guinea pig
130 MG/KG
Remarks: Peripheral Nerve and Sensation:Flaccid paralysis with appropriate anesthesia. Behavioral:Tremor. Behavioral:Convulsions or effect on seizure threshold.

IRRITATION DATA

Skin
Human
500 mg

Skin
Rabbit
500 mg
Remarks: Severe irritation effect

Eyes
Rabbit
100 mg
Remarks: Moderate irritation effect

SIGNS AND SYMPTOMS OF EXPOSURE

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Inhalation may result in spasm, inflammation and edema of the larynxand bronchi, chemical pneumonitis, and pulmonary edema. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. May be partially metabolized to cyanide in the body. CNS depression. Ataxia. Symptoms may be delayed.

ROUTE OF EXPOSURE

Skin Contact: Causes burns.
Skin Absorption: Toxic if absorbed through skin.
Eye Contact: Causes burns.
Inhalation: Toxic if inhaled. Material may be irritating to mucous membranes and upper respiratory tract. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Ingestion: Toxic if swallowed.

TARGET ORGAN INFORMATION
Liver. Central nervous system. Cardiovascular system. Kidneys.

CHRONIC EXPOSURE - CARCINOGEN
Result: This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Rat
Route of Application: Oral
Exposure Time: 52W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Brain and Coverings:Tumors.

Rat
Route of Application: Inhalation
Exposure Time: 52W
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

Rat
Route of Application: Inhalation
Exposure Time: 4H/52W
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Brain and Coverings:Tumors.

Rat
Route of Application: Inhalation
Exposure Time: 4H/52W
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Brain and Coverings:Tumors.

Rat
Route of Application: Oral
Exposure Time: 52W
Result: Tumorigenic:Neoplastic by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Ear:Tumors. Gastrointestinal:Tumors.

Rat
Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic:Carcinogenic by RTECS criteria. Brain and Coverings:Other degenerative changes. Gastrointestinal:Tumors.

IARC CARCINOGEN LIST

Rating: Group 2B

CHRONIC EXPOSURE - MUTAGEN

Human
40 MG/L (+S9)
Cell Type: lymphocyte
Mutation in microorganisms

Human
200 MG/L
Cell Type: Other cell types
DNA damage

Human
150 MG/L
Cell Type: Other cell types
Sister chromatid exchange

Human
25 MG/L
Cell Type: lymphocyte
Mutation in mammalian somatic cells.

Rat
46500 UG/KG
Oral
DNA

Rat
46500 UG/KG
Oral
Other mutation test systems

Rat
16500 UMOL/L
Cell Type: liver
DNA

Rat
16500 UMOL/L
Cell Type: liver
Other mutation test systems

Rat
1 MMOL/L
Cell Type: liver
Unscheduled DNA synthesis

Rat
50 MG/KG
Oral
Unscheduled DNA synthesis

Rat
30 MG/KG
Cell Type: S. typhimurium
Body fluid assay

Mouse
161 MG/L (+S9)
Cell Type: lymphocyte
Mutation in microorganisms

Mouse
50 MG/L (+S9)
Cell Type: Embryo
Mutation in microorganisms

Mouse
8800 UG/L
Cell Type: Embryo
Morphological transformation.

Mouse

6300 UG/L
Cell Type: fibroblast
Morphological transformation.

Mouse
30 MG/KG
Cell Type: S. typhimurium
Body fluid assay

Mouse
12500 NL/L
Cell Type: lymphocyte
Mutation in mammalian somatic cells.

Hamster
100 MMOL/L
Cell Type: ovary
Micronucleus test

Hamster
2 MG/L
Cell Type: Embryo
Morphological transformation.

Hamster
3710 MG/L
Cell Type: ovary
DNA damage

Hamster
200 MG/L
Cell Type: Embryo
DNA damage

Hamster
4 MMOL/L
Cell Type: ovary
Cytogenetic analysis

Hamster
6250 UG/L
Cell Type: lung
Cytogenetic analysis

Hamster
2500 UG/L
Cell Type: liver
Cytogenetic analysis

Hamster
2 MMOL/L
Cell Type: ovary
Sister chromatid exchange

Mammal
68 MMOL/L
Cell Type: lymphocyte
DNA

CHRONIC EXPOSURE - TERATOGEN

Species: Rat

Dose: 650 MG/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Species: Rat
Dose: 80 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 25 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-20D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Hamster
Dose: 641 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D PREG)
Result: Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Hamster
Dose: 641 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D PREG)
Result: Specific Developmental Abnormalities: Central nervous system. Specific Developmental Abnormalities: Musculoskeletal system.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 650 MG/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 644 MG/KG
Route of Application: Oral
Exposure Time: (2W MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count). Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat
Dose: 650 MG/KG
Route of Application: Oral

Exposure Time: (6-15D PREG)
Result: Maternal Effects: Other effects. Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Species: Rat
Dose: 40 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Maternal Effects: Other effects. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

Species: Mouse
Dose: 600 MG/KG
Route of Application: Oral
Exposure Time: (60D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count). Paternal Effects: Testes, epididymis, sperm duct. Paternal Effects: Other effects on male.

Species: Mouse
Dose: 32 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (5D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Hamster
Dose: 641 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Specific Developmental Abnormalities: Central nervous system.

CMR CAT.: Carc. Cat.2

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 7.4 - 1 mg/l

Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 96 h
Value: 8 - 12 mg/l

Test Type: LC50 Fish
Species: Cyprinus carpio
Time: 96 h
Value: 18 - 21.4 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this

material is highly flammable. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR
- UN#: 1093
- Class: 3
- PG: I
- Proper Shipping Name: Acrylonitrile, inhibited

IMDG
- UN#: 1093
- Class: 3
- PG: I
- Subrisk: 6.1
- Proper Shipping Name: Acrylonitrile, inhibited
- Marine Pollutant: No
- Severe Marine Pollutant: No

IATA
- UN#: 1093
- Class: 3
- PG: I
- Subrisk: 6.1
- Proper Shipping Name: Acrylonitrile, stabilized
- Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
- ANNEX I INDEX NUMBER: 608-003-00-4
- NOTA: D,E
- INDICATION OF DANGER: F T N
  Highly Flammable. Toxic. Dangerous for the environment.
- R-PHRASES: 45 11 23/24/25 41 43 37/38 51/53
  May cause cancer. Highly flammable. Toxic by inhalation, in contact with skin and if swallowed. Risk of serious damage to eyes. May cause sensitization by skin contact. Irritating to respiratory system and skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- S-PHRASES: 53 9 16 45 61
  Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid release to the environment. Refer to special instructions/safety data sheets.

COUNTRY SPECIFIC INFORMATION

Germany
- WGK: 3

SWITZERLAND
- SWISS POISON CLASS: 1*

NORWAY

Labelling for organic solvents where the package is 1liter or more.

YL-tall m3/l: 283500
YL-group: 5
Safety phrases: 38 42 210
In case of insufficient ventilation, wear suitable respiratory equipment. During fumigation/spraying wear suitable respiratory equipment. Use compressed air- or fresh air line breathing apparatus in confined spaces.

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

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