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----------ISO 9001: 2015----------

MATERIAL SAFETY DATA SHEET

1.Identification
1.1GHS Product identifier
Benzonitrile, 98%
Code B 1585

2.Hazard identification
2.1Classification of the substance or mixture
Acute toxicity - Oral, Category 4
Acute toxicity - Dermal, Category 4
2.2GHS label elements, including precautionary statements
Pictogram(s)

Signal word	Warning
Hazard statement(s)	H302 Harmful if swallowed H312 Harmful in contact with skin
Precautionary statement(s)	
Prevention	P264 Wash ... thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Response	P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/\u2026if you feel unwell. P330 Rinse mouth. P302+P352 IF ON SKIN: Wash with plenty of water/... P312 Call a POISON CENTER/doctor/\u2026if you feel unwell. P321 Specific treatment (see ... on this label). P362+P364 Take off contaminated clothing and wash it before reuse.
Storage	none
Disposal	P501 Dispose of contents/container to ...

2.3Other hazards which do not result in classification
none

3.Composition/information on ingredients
3.1Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
benzonitrile	benzonitrile	100-47-0	none	100%

4.First-aid measures
4.1Description of necessary first-aid measures
General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.
If inhaled
Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
In case of skin contact
Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .
In case of eye contact
First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.
If swallowed
Rinse mouth. Rest. Refer for medical attention .
4.2Most important symptoms/effects, acute and delayed
Benzonitrile may enter the human body by ingestion, absorption through the skin, or inhalation. The earliest symptoms of cyano compound intoxication may be weakness, headaches, confusion, and occasionally nausea and vomiting. The respiratory rate and

depth will usually be increased at the beginning and at later stages become slow and gasping. Blood pressure is usually normal, especially in the mild or moderately severe cases, although the pulse rate is usually more rapid than normal. (USCG, 1999)
4.3Indication of immediate medical attention and special treatment needed, if necessary
Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Cyanide and related compounds/

5.Fire-fighting measures
5.1Extinguishing media
Suitable extinguishing media
Foam, dry chemical, carbon dioxide. Water may be ineffective. Cool exposed containers with water. Wear goggles & self-contained breathing apparatus.
5.2Specific hazards arising from the chemical
Special Hazards of Combustion Products: Toxic hydrogen cyanide and oxides of nitrogen may form in fire. (USCG, 1999)
5.3Special protective actions for fire-fighters
Wear self-contained breathing apparatus for firefighting if necessary.

6.Accidental release measures
6.1Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.
6.2Environmental precautions
Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.
6.3Methods and materials for containment and cleaning up
Remove all ignition sources. Ventilate area of spill or leak. Absorb liquids in vermiculite, dry sand, earth, or a similar material adn deposit in sealed containers. it maybe nessary to contain and dispose of this chemical as a hazardous waste.

7.Handling and storage
7.1Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.
7.2Conditions for safe storage, including any incompatibilities
Separated from food and feedstuffs. Well closed. Keep in a well-ventilated room.Conditions for safe storage, including any incompatibilities: Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Hygroscopic: Handle and store under inert gas.

8.Exposure controls/personal protection
8.1Control parameters
Occupational Exposure limit values
no data available
Biological limit values
no data available
8.2Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
8.3Individual protection measures, such as personal protective equipment (PPE)
Eye/face protection
Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Skin protection
Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique(without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.
Respiratory protection
Wear dust mask when handling large quantities.
Thermal hazards
no data available

9.Physical and chemical properties

Physical state	clear to light yellow liquid
Colour	Liquid
Odour	Odor of volatile oil of almond
Melting point/ freezing point	179\u00b0C(lit.)
Boiling point or initial	191\u00b0C(lit.)

boiling point and boiling range	
Flammability	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	no data available
Flash point	70\u00b0C
Auto-ignition temperature	550\u00b0C
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	1.054 centistokes at 100 deg F
Solubility	In water:10 g/L (100 \u00baC)
Partition coefficient n-octanol/water (log value)	log Kow = 1.56
Vapour pressure	0.00786mmHg at 25\u00b0C
Density and/or relative density	1.01
Relative vapour density	3.6 (Relative to Air)
Particle characteristics	no data available

10.Stability and reactivity
10.1Reactivity
no data available
10.2Chemical stability
Stable under recommended storage conditions.
10.3Possibility of hazardous reactions
... Combustible but burns with difficulty.The cyano group can be readily hydrolyzed in the presence of mineral acids to produce stable, moderately toxic benzoic acid . When heated to decomposition, it emits highly toxic fumes of nitrogen oxides and hydrogen cyanide [Sax, 9th ed., 1996, p. 353].
10.4Conditions to avoid
no data available
10.5Incompatible materials
Strong acids which can liberate hydrogen cyanide. Forms explosive mixture with air.
10.6Hazardous decomposition products
When heated to decomp it emits toxic fumes of /cyanides and nitrogen oxides/.

11.Toxicological information
Acute toxicity
Oral: LD50 Rat oral 720 mg/kg bw
Inhalation: LC50 Rat inhalation 950 ppm/8 hr
Dermal: no data available
Skin corrosion/irritation
no data available
Serious eye damage/irritation
no data available
Respiratory or skin sensitization
no data available
Germ cell mutagenicity
no data available
Carcinogenicity
no data available
Reproductive toxicity
no data available
STOT-single exposure
no data available
STOT-repeated exposure
no data available
Aspiration hazard
no data available

12.Ecological information
12.1Toxicity
Toxicity to fish: no data available
Toxicity to daphnia and other aquatic invertebrates: EC50; Species: Daphnia magna (Water Flea) age < or =24 hr; Conditions: freshwater, static, 20-22\u00b0C, pH 7.6-7.7; Concentration: 200000 ug/L for 24 hr; Effect: intoxication, immobilization /formulation
Toxicity to algae: no data available
Toxicity to microorganisms: no data available
12.2Persistence and degradability

AEROBIC: Benzonitrile , present at 100 mg/L, reached 63.4% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(1). Other screening studies give similar results (63.4-80.8%) and benzonitrile is confirmed to be biodegradable according to the standard test of the Japanese Ministry of Industry and Trade (MITI) that employs a mixed inoculum obtained from freshwater, soil, and sludge(2-4). The theoretical oxygen demand (ThOD) for benzonitrile in Ohio River Water from Cincinnati and/or aged sewage sludge were 0, 60, 90% and/or 0, 40, 80% after 2, 5, and 12 days, respectively(5). The BOD for benzonitrile in a bench-scale activated sludge unit was measured to be 93-98%(6). The BOD for benzonitrile in river water, present at 50 ppm, was 7%(7). Benzonitrile achieved 100% degradation after 280 minutes in a phosphate buffer solution in the soil and after 500 minutes in a soil slurry(8). Benzonitrile also achieved 20% and 44% in ash and ash-amended soil slurries at 2000 minutes, respectively(8). Benzonitrile achieved 88% degradation after 8, 10, and 12.5 hours in char-amended soil, soil and washed-char-amended soil slurries(9).

12.3Bioaccumulative potential

An estimated BCF of 5 was calculated in fish for benzonitrile(SRC), using a measured log Kow of 1.56(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4Mobility in soil

The Koc of benzonitrile is estimated as 150(SRC), using a log Kow of 1.56(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that benzonitrile is expected to have moderate mobility in soil(SRC).

12.5Other adverse effects

no data available

13.Disposal considerations

13.1Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14.Transport information

14.1UN Number

ADR/RID: UN2224 IMDG: UN2224 IATA: UN2224

14.2UN Proper Shipping Name

ADR/RID: BENZONITRILE

IMDG: BENZONITRILE

IATA: BENZONITRILE

14.3Transport hazard class(es)

ADR/RID: 6.1 IMDG: 6.1 IATA: 6.1

14.4Packing group, if applicable

ADR/RID: II IMDG: II IATA: II

14.5Environmental hazards

ADR/RID: no IMDG: no IATA: no

14.6Special precautions for user

no data available

14.7Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15.Regulatory information

15.1Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
benzonitrile	benzonitrile	100-47-0	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Not Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.