

Material Safety Data Sheet

Date: 06/10/2019

Rev. 5

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name : SODIUM CYANIDE
Usage : Extraction of gold, silver, and other nonferrous metals from ores
Electroplating, Heat treatment of metals
Production of hydrocyanic acid, insecticides, dyes and pigments
Fumigation, Ore floatation
Organic synthesis
Manufacturer : TAE KWANG INDUSTRIAL Co., Ltd.
310, DONGHO-RO, JUNG-GU, SEOUL, KOREA
C.P.O BOX : 1173 SEOUL
CABLE "TAE KWANG" SEOUL
TELEX "PIGEON" K28219
FACSIMILE 82-2-3406-0226
TELEPHONE 82-2-3406-0521
Emergency Contact Point : TAE KWANG INDUSTRIAL Co., Ltd. Petrochemical 3rd Plant
Safety & Environment(S&E) Team or
TAE KWANG INDUSTRIAL Co., Ltd.
Petrochemical Sales Department
Tel. No. S&E Team 82-52-259-9703 or
Sales Department 82-2-3406-0334

2. HAZARDOUS IDENTIFICATION

This material is hazardous according to Regulation of Korea Toxic Chemical Control Act

: **HAZARDOUS CHEMICAL**

And this material is toxic chemical and Accident Precaution Chemical according to Regulation of Korea

: **Toxic Chemicals Control Act : Toxic Chemical and Accident Precaution Chemical**

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for Transport by ship : Dangerous Goods

Health hazard classification :

Acute toxicity substance(oral)	Category 2
Acute toxicity substance(dermal)	Category 1
Reproductively toxicity substance	Category 2
Acute aquatic toxicity level	Category 1
Chronic aquatic toxicity level	Category 1

Warning

○ Danger/Hazard Symbol



○ Hazard Statement

H300: Fatal if swallowed
H310: Fatal in contact with skin
H330: Fatal if inhaled
H400: Very toxic to aquatic life
H410: Very toxic to aquatic life with long-lasting effects

○ Precautionary statements

P260: Do not breathe dust/fumes/gas/mist/vapours/spray
P262: Do not get in eyes, on skin, or on clothing.
P264: Wash ... thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area

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P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P284: Wear respiratory protection in case of inadequate ventilation
P301+310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/
P302+352: Wash with plenty of water if on skin
P304+340: Remove person to fresh air and keep comfortable for breathing if inhaled
P310: Immediately call a POISON CENTER/doctor/
P320: Urgently do first aid
P321: Do first aid
P330: Rinse mouth.
P361+364: Take off immediately all contaminated clothing, wash contaminated clothing before reuse
P391: Collect spillage.
P403+233: Store in a well ventilated place. Keep container tightly closed
P405: Store locked up.
P501: Dispose of contents/container in accordance with local regulation

NFPA

Health	3
Flammable	0
Reactivity	0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	Synonym	CAS. No.	Composition	EC Number	UN Number
Sodium Cyanide	Sodium Cyanide	144-33-9	98.0 wt%	205-599-4	1689
Caustic Soda	Sodium hydroxide	1310-73-2	0.5 wt%	215-185-5	1823
Sodium Carbonate	Sodium Carbonate	497-19-8	1.0 wt%	207-838-8	-
Water	Water, Oxidane	7732-18-5	0.5 wt%	-	-

4. FIRST AID MEASURES

Inhalation :

When safe to enter area, remove from exposure. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention immediately.

Skin contact :

Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes).
Get medical attention, if needed.

Eye contact :

Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains. Continue irrigating with normal saline until ready to transport to hospital. Cover with sterile bandages. Get medical attention immediately.

Ingestion :

Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

Antidote :

Amyl Nitrite, inhalation; Sodium Nitrite, intravenous; Sodium Thiosulfate, infusion; oxygen.

First aid treatment according to the patient's situation :

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If the patient is conscious and breathing



Put the broken tablet of Amyl Nitrite to patient's nose five times at an interval of fifteen seconds.
If necessary, it's possible to change the tablet with a new one every five minutes.
It's possible to use three or four tablets by changing them.

If a patient swallows Sodium Cyanide.

In case of swallowing Sodium Cyanide, it's necessary to induce vomiting in the patient through the use of an emetic such as one percent of Sodium Thiosulfate or Soapywater.

If the patient is unconscious but breathing



Never give anything by mouth to unconscious patient.
Put the broken tablet of Amyl Nitrite to patient's nose for fifteen seconds, and repeat this procedure five times at an interval of fifteen seconds.
Have a patient inhale oxygen when he shows no progress toward recovery.
And it's possible to give oxygen inhalations to a patient at an interval of fifteen seconds, after inserting Amyl Nitrite on the edge of the oxygen resuscitator.
If necessary, it's possible to change the tablet with new one every three minutes.
It's possible to use three or four tablets by changing them.

If the patient is not breathing.



Practise artificial respiration until the patient begins to breathe.
When a patient begins to breathe the first aid administered should be with Amyl Nitrite.

Medical Treatment :

The medical treatment should be administered by a physician.
Please refer to the items printed on the antidote box for a remedy against poisoning.
Put the broken tablet of Amyl Nitrite to patient's nose for fifteen seconds, during the preparation for an injection of Sodium Nitrite & Sodium Thiosulfate.

After the discontinuance of Amyl nitrite treatment, ten cubic centimeter of three percent of Sodium Nitrite should be given by venous injection to the patient at the rate of 2.5cc per a minute.
and then fifty cubic centimeters of twenty five percent of Sodium Thiosulfate should be injected at the same rate as the above, while monitoring the patient for signs of congestion.

The second remedy should be used in a quantity of half as much of first dosage after two hours from the start of treatment.

However, a dosage of Methylene Blue is forbidden if the patient has been treated with Amyl Nitrite.

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5. FIRE FIGHTING MEASURES

Extinguishing media :

Adequate extinguishing media	regular dry chemical, water, regular foam
Large fire	Use regular foam or flood with fine water spray.
Inadequate extinguishing media	Carbon dioxide

Specific hazards arising from the chemical :

- Pyrolysis product:cyanide compounds
- Fire and Explosion Hazards : N/A

Fire fighting :

Fire Fighters should wear self contained breathing apparatus and adequate protective clothing if risk of exposure to products of decomposition.
If safe to do so, remove containers from area of fire.
Stay away from the ends of tanks
Extinguish large fire in safe area and safe distance.
Dike for later disposal
Don't spray exposed material with high pressured water directly to prevent dispersing this material.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions :

Clear area of all unprotected personnel.
Do not touch spilled material
Stop leak if possible without personal risk
Reduce vapors with water spray

Environmental Precaution

- Air
 - Indirectly spray with water and decrease vapor from this spilled material.
 - Dispose the potential hazard waste of the spilled material and collect.
- Soil
 - Secure the area such as dike and pit for store.
 - Cover the spilled material with plastic sheet and waterproof cloth to minimize spreading and keep out of water.
- Water
 - Put oxidizing agent such as dilute sodium hypochlorite, calcium hypochlorite into the contaminated water.
 - Add the alkaline material such as lime and soda ash supplementarily.

Methods for containment and cleaning up :

- Small spills
 - Cover or absorb with dry sand, soil, the other incombustible material and move the material into the proper container.
 - Collect and seal in properly labelled containers or drums for disposal.
- Large spills
 - Dike for later disposal.
 - Keep unnecessary people away, isolate hazard area and deny entry.
 - Increase ventilation before entering closed area.
 - Notify local government,local environment office,police station, fire station or local labor authority.
 - Minster of Environment distributes the report to other other organization.

7. HANDLING AND STORAGE

Because sodium cyanide is extremely toxic, all persons handling the material must be familiar with and observe the following instructions.

Handling :

- a) Make sure that sodium cyanide solid or solution does not come into direct contact with the body.

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- Use rubber gloves, aprons, boots, goggles and other protective items when handling.
- b) Be sure not to inhale air containing sodium cyanide powder or cyanic acid vapor.
Cyanic acid vapor is especially dangerous since it does not have a sharp odor and is difficult to be detected. Wear dust-proof masks or gas mask when necessary.
 - c) Do not handle the material near places where acids is handled since acid reacts with sodium cyanide and forms cyanic acid vapor.
 - d) Remove immediately by washing in case sodium cyanide solution is spilled since cyanic acid vapor is also formed by the reaction with carbonic acid gas in the air.
 - e) Provide ventilation equipment in areas where sodium cyanide is handled for a long time.
 - f) The handling area should be such an easy-to-wash concrete floor. Use a treatment tank for drain water.
 - g) This material should be handled by at least two workers to watch the situation with each other.
 - h) Do not eat foods or drink beverage in the same area where sodium cyanide is handled.
 - i) The workers must take a bath or shower and change their clothes after the work.

Storage :

- a) Must be stored in a cool, dry, well ventilated place, in a special locked storeroom and out of direct sunlight
- b) Must not be stored in any place where acidic gases may be generated or, acid, nitrates or nitrites are stored.
- c) When the packages is not opened, no special ventilation equipment is required.
But avoid long term storage once sodium cyanide is dissolved or the chemicals comes into contact with air.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupation Exposure Limit :

Korea Regulation : TWA - $3\text{mg}/\text{m}^3$, STEL - $5\text{mg}/\text{m}^3$
ACGIH Regulation : TLV-TWA - $5\text{mg}/\text{m}^3$

Adequate exposure control :

Ensure compliance with applicable exposure limit.

Personnel protective equipment :



Respirator :

Respirator must be complete examination of KOSHA ("안" mark)
Use NIOSH(U.S.A) & OSHA(U.S.A) Approved respirator whenever necessary.
Self contained breathing apparatus is preferred.

Eye protection :

Wear splash resistant safety goggles with a facepiece.
Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Gloves :

Wear appropriate chemical resistant gloves.

Clothing :

Wear appropriate chemical resistant clothing.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state : Crystalline solid
Colour : White
Odour : Not available
Molecular Formula : NaCN
Solubility : Solubility in 100 grams of water

Temperature (°C)	0	25	35	45
Solubility (grams)	43	64	82	82

Specific Gravity : 1.595 at 20°C
Relative Vapour Density(air = 1) : Not available
Vapour Pressure(20°C) : Not available
Flash Point(°C) : Not applicable
Flammability Limits(%) : Not applicable
Autoignition Temperature(°C) : Not applicable
Melting Point/Range(°C) : 562.3°C
pH : Not available

10. STABILITY AND REACTIVITY

Chemical stability : Stable under normal temperature and pressure.
Conditions to avoid : Avoid heat, flames, sparks and other sources of ignition.
Containers may rupture or explode if exposed to heat.
Incompatible materials : Acids, oxidizing materials, combustible materials, halogens, peroxides, metals
Hazardous decomposition : Cyanide compounds

11. TOXICOLOGICAL INFORMATION

1. Information on the likely route of exposure.

Inhalation : None of data
Ingestion : None of data
Skin contact : None of data
Eye contact : None of data

2. Delayed and immediate effects and chronic effects form short and long term exposure.

- Acute Toxicity
 - Oral : LD50 5.73 mg/kg Rat
 - Skin: LD50 14.6 mg/kg
 - Inhalation: None of data
- Skin corrosion/irritation : Category 1
- Serious eye damage/irritation : Category 2
- Respiratory sensitization : None of data
- Skin sensitization : None of data
- Carcinogenicity : Not Available
- Germ cell mutagenicity: None of data
- Reproductive toxic: Category 2
- Specific targart organ systemic toxicity(single exposure) : None of data
- Specific targart organ systemic toxicity(repeated exposure) : Class 1
(nerves system,spermary,kidney,adrenal,spleen)
- Aspiraton hazad : None of data

3. Numerical measure of Toxicity(such as acute toxicty estimate)

None of data

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12. ECOLOGICAL INFORMATION

1. Aquatic Terrestrial Ecological Toxicity

- | | |
|----------------------------------|-----------------------|
| <input type="radio"/> Fish | LC50 0.102 mg/L 96 hr |
| <input type="radio"/> Crustacean | EC50 0.426 mg/L 96 hr |
| <input type="radio"/> Algae | None of data |

2. Persistence and Degradability

- | | |
|-------------------------------------|--------------|
| <input type="radio"/> Persistence | None of data |
| <input type="radio"/> Degradability | None of data |

3. Bioaccumulative Potential

- | | |
|--|--------------|
| <input type="radio"/> Biodegradability | None of data |
| <input type="radio"/> Accumulation | None of data |

4. Mobility in soil

None of data

5. Other adverse effects

None of data

13. DISPOSAL CONSIDERATIONS

Disposal methods :

Dispose in accordance with Waste Control Act in Korea and all applicable regulations

U.S. disposal regulations : U.S. EPA 40 CFR 262

Hazardous waste number(s) : P106

Disposal Consideration:

None of data

14. TRANSPORT INFORMATION

UN Number : 1689
UN Proper shipping name : SODIUM CYANIDE, SOLID
Transport hazard class : 6.1
Packing group : 1
Marine pollutant : applicable

Special Precautions , which a user needs to be aware of, or needs to comply with in connection with transport :

In case of fire, emergency procedures class F-A

In case of spills, emergency procedures class S-A

15. REGULATORY INFORMATION

Regulation for Korea Industrial Safety and Health Act :

Work environment measurement required substance, regulated substance, specially controlled substance

Regulation of Korea Toxic Chemicals Control Act :

Accident precaution chemical, toxic chemical

Regulation for Korea Fire Services Act :

Not Applicable

Korea Wastes Control Act :

Designated Wastes

High-Pressure Gas Safety Control Act

Not Applicable

Other Regulation.

Other Domestic Regulation :

- Persistent Organic Pollutants Administration Law : N/A

- Hazardous and Noxious Substances (HNS) : Applicable

- Act on Control etc. of Manufacture of Specific Substance for Protection of the Ozone Layer : N/A

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- Persistent Organic Pollutants Administration Law : N/A
- EU classification information
 - Firm classification results : N/A
 - Hazard statement : N/A
 - Precautionary measures statement : N/A
- U.S. Regulations
 - OSHA Regulation (29CFR1910.119) : N/A
 - CERCLA 103 Regulation (40CFR302.4) : 4.53599(kg) 10(lb)
 - EPCRA 302 Regulation (40CFR355.30) : 4.53599(kg) 100(lb)
 - EPCRA 304 Regulation (40CFR355.40) : 4.53599(kg) 100(lb)
 - EPCRA 313 Regulation (40CFR372.65) : Available
- Rotterdam Convention substance: N/A
- Stockholm Convention substance : N/A
- Montreal Protocol substance : N/A

16. OTHER INFORMATION

The References are provided as followings :

ICSC
HSDB
CICAD
IUCLID