

Design Report of Safety Data Sheet

Report No. :HGNM21X179 Issue date:2021. 11. 18	
Product Name:	CALCIUM HYPOCHLORITE
Applicant:	TIANJIN YUFENG CHEMICAL CO., LTD.
Composition of the product:	Calcium hypochlorite : 60% ~ 70% ; Sodium chloride : 15% ~ 25% ; Moisture : 5.5% ~ 16% ; Water insoluble substance : 3% ~ 5% ; Calcium chloride : 0.5% ~ 3% ; Sodium hydroxide : 1% ~ 2.5% .
Warranty of Design:	GB/T 17519-2013、GB/T 16483-2008
Design Result of SDS please see next page.	
Designer:	
Auditor:	
Approver:	
 <p>常州合規思遠產品安全技術服務有限公司 Changzhou Hegui Siyuan Products Safety Technology Service Co., Ltd.</p>	

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2. Information from applicant is the key of this report, our company will not respond for the wrong of applicant.
3. If there is any change in the chemical information submitted by the client, this report will automatically become invalid.
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Safety Data Sheet

CALCIUM HYPOCHLORITE

Version: V2.0.0.1

Report No.: HGNM21X179

Creation Date: 2021/11/18

Revision Date: 2021/11/18

*Prepared according to GB/T 17519-2013 and GB/T 16483-2008

1 Identification of the chemical and supplier

Product identifier

Product Name	CALCIUM HYPOCHLORITE
CAS No.	Not applicable
EC No.	Not applicable
Molecular Formula	Not applicable

Recommended use of the product and restrictions on use

Relevant identified uses	Please consult manufacturer.
Uses advised against	Please consult manufacturer.

Details of the supplier of the Safety Data Sheet

Name of the company	TIANJIN YUFENG CHEMICAL CO., LTD.
Address of the company	DONGLANTUO VILLAGE, WANGWENZHUANG TOWN, XIQING DISTRICT, TIANJIN
Post code	—
Telephone number	—
Fax number	—
E-mail address	—

Emergency phone number

Emergency phone number	022-83999266
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2 Hazard(s) identification

Emergency overview

Solid. Contact with combustible material may cause fire. Harmful if swallowed. Causes skin burns. Risk of serious damage to eyes. Risk of serious damage to eyes. Very toxic to aquatic organisms, Use appropriate container to avoid environmental contamination. May cause long-term adverse effects in the aquatic environment. Use appropriate container to avoid environmental contamination.

Hazard classification according to GHS

Oxidizing Solids	Category 2
Acute Toxicity – Oral	Category 4
Skin Corrosion/Irritation	Category 1B
Serious Eye Damage/Irritation	Category 1
Hazardous To The Aquatic Environment – Short-Term (Acute) Hazard	Category 1

Hazardous To The Aquatic Environment – Long-Term (Chronic) Hazard	Category 1
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GHS Label elements

Hazard pictograms	
Signal word	Danger

Hazard statements

H272	May intensify fire; oxidizer
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects

Precautionary statements

◆ Prevention

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220	Keep away from clothing and other combustible materials.
P221	Take preventive measures to avoid mixing with fuel.
P260	Do not breathe dust/fume.
P264	Wash face and hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

◆ Response

P310	Immediately call a POISON CENTER/doctor.
P321	Specific treatment (see on this label).
P330	Rinse mouth.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P306+P360	IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P370+P378	In case of fire: Use appropriate extinguishing media mentioned in Section 5 of the SDS to extinguish.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P371+P380+P375	In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
◆ Storage	
P405	Store locked up.
◆ Disposal	
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard description

◆ Physical and chemical hazards

	Contact with combustible material may cause fire.
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◆ Health hazards

Inhaled	Burning sensation. Sore throat. Wheezing. Laboured breathing. Shortness of breath.
Ingestion	Abdominal pain. Burning sensation. Shock or collapse.
Skin Contact	Redness. Pain. Serious skin burns. Blisters.
Eye	Redness. Pain. Blurred vision. Severe deep burns.

◆ Environmental hazards

	This product is very toxic to aquatic life with long lasting effects. Please refer to 12th chapter of SDS.
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3 Composition/information on ingredients

Substance/mixture

	Mixture
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Component	CAS No.	EC No.	Concentration (wt, %)
Calcium hypochlorite	7778-54-3	231-908-7	60~70
Sodium chloride	7647-14-5	231-598-3	15~25
Moisture	7732-18-5	231-791-2	5.5~16
Water insoluble substance	-	-	3~5
Calcium chloride	10043-52-4	233-140-8	0.5~3
Sodium hydroxide	1310-73-2	215-185-5	1~2.5

4 First-aid measures

Description of first aid measures

General advice	Immediate medical attention is required. Show this safety data sheet (SDS) to the doctor in attendance.
Eye contact	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Skin contact	Remove contaminated clothes. Rinse skin with plenty of water or shower.
Ingestion	Rinse mouth. Give plenty of water to drink. Do NOT induce vomiting. Refer for medical attention.
Inhalation	Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer for medical attention.

Protecting of first-aiders

Ensure that medical personnel are aware of the substance involved. Take precautions to protect themselves and prevent spread of contamination.

Most important symptoms, acute and delayed

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| 1 | Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. |
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Advice for protecting the rescuer

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| 1 | Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material. |
| 2 | Avoid all contact with any organic matter including fuel, solvents, sawdust, paper or cloth and other incompatible materials, as ignition may result. |
| 3 | Remove all sources of ignition and increase ventilation. |
| 4 | Avoid contact with skin and eyes. |
| 5 | Avoid inhalation of dusts. |
| 6 | Use personal protective equipment including respirator. |

Special note to the doctor

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|---|--------------------------|
| 1 | Treat symptomatically. |
| 2 | Symptoms may be delayed. |

5 Fire-fighting measures**Extinguishing media**

Suitable extinguishing media	Water, sand, foam.
Unsuitable extinguishing media	No special notes.

Specific hazards arising from the substance or mixture

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| 1 | Will not burn but increases intensity of fire. |
| 2 | Contact with combustibles such as wood, paper, oil or finely divided metal may produce spontaneous combustion or violent decomposition. |
| 3 | Has a fire-promoting effect due to release of oxygen. |
| 4 | The material may provide sufficient oxygen to make the fire fierce and self sustaining. |
| 5 | Smothering action may not be effective for established fire. |
| 6 | Fire may produce irritating, poisonous or corrosive gases. |
| 7 | Development of hazardous combustion gases or vapor possible in the event of fire. |
| 8 | May expansion or decompose explosively when heated or involved in fire. |

Fire precautions and protective measures

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| 1 | As in any fire, wear self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) and full protective gear. |
| 2 | Fight fire from a safe distance, with adequate cover. |
| 3 | Prevent fire extinguishing water from contaminating surface water or the ground water system. |

6 Accidental release measures**Personal precautions, protective equipment and emergency procedures**

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| 1 | Keep combustibles (wood, paper, oil, etc.) away from spilled material. |
| 2 | Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. |

3	Do not touch or walk through spilled material.
4	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
5	Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
6	Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.
7	Use personal protective equipment, do not breathe dust/fume.

Environmental precautions

1	Prevent further leakage or spillage if safe to do so.
2	Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

1	Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.
2	Do not touch broken containers and spills before putting on appropriate protective clothing.
3	Use clean, non-sparking tools to collect absorbed material.
4	Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.
5	It is recommended that emergency personnel wear dust masks and wear anti-static clothing.
6	Small spills: Collect spillage with a clean shovel and place in a clean, dry, loosely closed container to remove the container from the leak.
7	A large number of leaks: wetting with water and building a dike.
8	Prevent spills from entering water bodies, sewers, basements, or confined spaces.
9	Isolation of contaminated areas and restrictions on access.
10	It is recommended that emergency personnel wear dust masks and wear anti-corrosion clothing.
11	Cover the spill with a plastic sheet to reduce scattering.
12	Cut off the source of the leak as much as possible.
13	Keep leaks in a ventilated place.
14	It is recommended that emergency personnel wear dust masks.
15	Collect the spill with a clean shovel and place it in a clean, dry, loosely closed container and move the container away from the leak.
16	Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

7 Handling and storage

Handling

1	Handling is performed in a well ventilated place.
2	Wear suitable protective equipment.
3	Avoid contact with skin and eyes.
4	Keep away from heat/sparks/open flames/ hot surfaces.

Storage

1	Keep containers tightly closed.
2	Keep containers in a dry, cool and well-ventilated place.
3	Keep away from heat/sparks/open flames/hot surfaces.
4	Store away from incompatible materials and foodstuff containers.

8 Exposure controls/personal protection

Control parameters

- Occupational Exposure limit values (Chemical Harmful Factors)

Component	Standard	OELs	Standard value mg/m ³	Critical adverse health effects	Remark
Sodium hydroxide	GBZ 2.1-2019	PC-TWA	-	Upper respiratory tract, eye and skin irritation	-
		PC-STEL	-		
		MAC	2		

- Biological limit values

Biological limit values	
	No relevant regulations


- Monitoring methods

1	EN 14042 Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
2	GBZ/T 300.1~GBZ/T 300.160-2017; GBZ/T 300.161~GBZ/T 300.164-2018 Determination of toxic substances in workplace air (Series standard).

Engineering controls

1	Ensure adequate ventilation, especially in confined areas.
2	Ensure that eyewash stations and safety showers are close to the workstation location.
3	Use explosion-proof electrical/ventilating/lighting/equipment.
4	Set up emergency exit and necessary risk-elimination area.

Personal protection equipment

General requirement	
	
Eye protection	Must wear appropriate anti-corrosion goggles.
Hand protection	Must wear acid and alkali resistant chemical protective gloves.
Respiratory protection	Must wear appropriate personal respiratory protective equipment.
Skin and body protection	Must wear acid and alkali resistant chemical protective clothing.

9 Physical and chemical properties

Physical and chemical properties

Appearance	White particle
Odor	No information available
Odor threshold	No information available
pH	No information available
Melting point/freezing point(°C)	No information available
Initial boiling point and boiling range(°C)	No information available
Flash point(Closed cup, °C)	Not applicable
Evaporation rate	Not applicable

Flammability	Not flammable
Upper/lower explosive limits[%(v/v)]	Upper limit: No information available; Lower limit: No information available
Vapor pressure	Not applicable
Vapor density(Air = 1)	Not applicable
Relative density(Water=1)	No information available
Solubility	No information available
n-octanol/water partition coefficient	No information available
Auto-ignition temperature(°C)	No information available
Decomposition temperature(°C)	No information available
Viscosity	Not applicable

10 Stability and reactivity

| Stability and reactivity

Reactivity	Contact with incompatible substances can cause decomposition or other chemical reactions.
Chemical stability	Stable under proper operation and storage conditions.
Possibility of hazardous reactions	Mixture with metal powders may explode if heated, impact or friction. In contact with organic peroxides cause a fire immediately. In contact with active metals (alkali metals, Na, Ca etc.) causes a reaction and release hydrogen. React violently with acids, phenols or alcohols.
Conditions to avoid	Incompatible materials, heat, flame and spark.
Incompatible materials	Metal powder, metal amino compounds, ammonia, ammonium salts, amine, amide, carboxylic acids, phenols, alcohols, carboxylic acid esters, nitriles, sulfuric acid, concentrated nitric acid and phosphoric acid. Organic peroxides. Alkali, sodium, calcium, and other active metal, halogen, metal oxide, nonmetal oxide, acyl halide and metal phosphide. Acids, phenols, alcohols and nitro substituted hydrocarbon.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 Toxicological information

| Acute toxicity

Component	LD ₅₀ (oral)	LD ₅₀ (dermal)	LC ₅₀ (inhalation,4h)
Sodium chloride	3000mg/kg(Rat)	> 10000mg/kg(Rabbit)	No information available
Calcium chloride	1000mg/kg(Rat)	No information available	No information available
Calcium hypochlorite	850mg/kg(Rat)	No information available	No information available

| Carcinogenicity

Component	List of carcinogens by the IARC Monographs	Report on Carcinogens by NTP
Calcium hypochlorite	Not Listed	Not Listed
Sodium chloride	Not Listed	Not Listed
Moisture	Not Listed	Not Listed

Water insoluble substance	Not Listed	Not Listed
Calcium chloride	Not Listed	Not Listed
Sodium hydroxide	Not Listed	Not Listed

Others

CALCIUM HYPOCHLORITE	
Skin corrosion/irritation	Causes severe skin burns and eye damage(Category 1B)
Serious eye damage/irritation	Causes serious eye damage(Category 1)
Skin sensitization	Based on available data, the classification criteria are not met
Respiratory sensitization	Based on available data, the classification criteria are not met
Reproductive toxicity	Based on available data, the classification criteria are not met
STOT-single exposure	Based on available data, the classification criteria are not met
STOT-repeated exposure	Based on available data, the classification criteria are not met
Aspiration hazard	Based on available data, the classification criteria are not met
Germ cell mutagenicity	Based on available data, the classification criteria are not met
Reproductive toxicity(additional)	Based on available data, the classification criteria are not met

12 Ecological information

Acute aquatic toxicity

Component	Fish	Crustaceans	Algae
Sodium chloride	LC ₅₀ : 7400mg/L (96h)(Fish)	EC ₅₀ : 2120mg/L (48h)(Crustaceans)	No information available
Sodium hydroxide	LC ₅₀ : 196mg/L (96h)(Fish)	EC ₅₀ : 40.4mg/L (48h)(Crustaceans)	No information available
Calcium chloride	LC ₅₀ : 9500mg/L (96h)(Fish)	EC ₅₀ : 1400mg/L (48h)(Crustaceans)	No information available
Calcium hypochlorite	LC ₅₀ : 0.27mg/L (96h)(Fish)	EC ₅₀ : 0.09mg/L (48h)(Crustaceans)	No information available

Chronic aquatic toxicity

Chronic aquatic toxicity	No information available
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Persistence and degradability

Component	Persistence (water/soil)	Persistence (air)
Sodium chloride	Low	Low
Moisture	Low	Low

Bioaccumulative potential

Component	Bioaccumulative potential	Comments
Sodium chloride	Low	Log Kow=0.5392
Moisture	Low	Log Kow=-1.38

Mobility in soil

Component	Mobility in soil	Soil Organic Carbon-Water Partitioning Coefficient (Koc)
Sodium chloride	Low	14.3
Moisture	Low	14.3

Results of PBT and vPvB assessment

Component	Results of PBT and vPvB assessment [according to (EC) No 1907/2006]
Calcium hypochlorite	Not PBT/vPvB
Sodium chloride	Not PBT/vPvB
Calcium chloride	Not applicable
Sodium hydroxide	Not applicable

13 Disposal considerations

Disposal considerations

Waste chemicals	Before disposal should refer to the relevant national and local laws and regulation. Recommend the use of incineration disposal.
Contaminated packaging	Containers may still present chemical hazard when empty. Keep away from hot and ignition source of fire. Return to supplier for recycling if possible.
Disposal recommendations	Refer to section waste chemicals and contaminated packaging.

14 Transport information

Label and Mark

Transporting Label	
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IMDG-CODE

UN number	3487
UN proper shipping name	CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, CORROSIVE with not less than 5.5% but not more than 16% water
Transport hazard class	5.1
Transport subsidiary hazard class	8
Packing group	II
Special provisions	314 322
Limited quantities	1kg
Excepted quantities	E2
Marine pollutant (Yes or no)	Yes
EmS No.	F-H,S-Q

IATA-DGR

UN number	3487
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UN proper shipping name	CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, CORROSIVE with not less than 5.5% but not more than 16% water
Transport hazard class	5.1
Transport subsidiary hazard class	8
Packing group	II
Excepted quantities	E2
Passenger and Cargo Aircraft Limited Quantity Packing Instructions	Y544
Passenger and Cargo Aircraft Limited Quantity Maximum net Quantity per Package	2.5kg
Passenger and Cargo Aircraft Packing Instructions	558
Passenger and Cargo Aircraft Maximum net Quantity per Package	5kg
Cargo Aircraft Packing Instructions	562
Cargo Aircraft Maximum net Quantity per Package	25kg
Special provisions	A8, A136, A803
ERG code	5C

| UN-ADR

UN number	3487
UN proper shipping name	CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, CORROSIVE with not less than 5.5% but not more than 16% water
Transport hazard class	5.1
Transport subsidiary hazard class	8
Packing group	II
Special provisions	314 322
Limited quantities	1 kg
Excepted quantities	E2
Packing instructions	P002 IBC08
Special packing provisions	B4 B13
Mixed packing provisions	MP2
Portable tanks and bulk containers instructions	-
Portable tanks and bulk containers special provisions	-
ADR tank code	SGAN
ADR tank special provisions	TU3
Vehicle for tank carriage	AT
Transport category (Tunnel restriction code)	2 (E)
Special provisions for	V11

carriage(Packages)	
Special provisions for carriage (Bulk)	-
Special provisions for carriage (Loading, unloading and handling)	CV24 CV35
Special provisions for carriage (Operation)	-
Hazard identification No.	58
Notes	-

Others

Methods of packing	Ampoule outside the ordinary wooden box. Threaded glass, metal cover pressure bottles, plastic bottles or metal (cans) outside the ordinary wooden box etc. Threaded glass, metal cover pressure bottles, plastic bottles or metal (cans) outside the ordinary wooden box. Frosted glass bottle or threaded glass outside the ordinary wooden box. Packaging as recommended by manufacturer.
Precautions for transport	Strictly prohibited shipping or transportation with acids, flammable goods, organic matter, reducing agents, spontaneous combustion, flammable goods which are wet. Transport vehicles should be equipped with the appropriate variety and quantity of fire equipment and emergency equipment leakage during transport. Before transport, should be preceded by checking whether container integrity, sealing. The transport unit must be placarded and marked in accordance with relevant transporting requirements.

15 Regulatory information

International chemical inventory

Component	EINECS	TSCA	DSL	IECSC	NZIoC	PICCS	KECI	AIIC	ENCS
Calcium hypochlorite	√	√	√	√	√	√	√	√	√
Sodium chloride	√	√	√	√	√	√	√	√	√
Moisture	√	√	√	√	√	√	√	√	√
Water insoluble substance	×	×	×	×	×	×	×	×	×
Calcium chloride	√	√	√	√	√	√	√	√	√
Sodium hydroxide	√	√	√	√	√	√	√	√	√

[EINECS]	European Inventory of Existing Commercial Chemical Substances
[TSCA]	United States Toxic Substances Control Act Inventory
[DSL]	Canadian Domestic Substances List
[IECSC]	China Inventory of Existing Chemical Substances
[NZIoC]	New Zealand Inventory of Chemicals
[PICCS]	Philippines Inventory of Chemicals and Chemical Substances
[KECI]	Korea Existing Chemicals Inventory
[AIIC]	Australia. Inventory of Industrial Chemicals (AIIC)
[ENCS]	Japan Inventory of Existing & New Chemical Substances

Chinese chemical inventory

Component	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O

Calcium hypochlorite	√	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Sodium chloride	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Moisture	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Water insoluble substance	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Calcium chloride	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Sodium hydroxide	√	x	x	x	x	x	x	x	x	x	x	x	x	x	x

- [A] Catalog of Hazardous Chemicals(2015 Edition), Notice 5th 2015, the former China State Administration of Work Safety together with the Ministry of Industry and Information Technology, etc.
- [B] List of Toxic Chemicals Restricted in China, Notice 60th 2019, the Ministry of Ecology and Environment, Ministry of Commerce, General Administration of Customs.
- [C] List of Ozone Depletion Chemicals Controlled to be Imported/Exported in China (First to Sixth batches) , Notice from 2000 to 2012, the former Ministry of Environmental Protection of PRC.
- [D] Catalog of Hazardous Chemicals for Priority Management (First and Second batches) , Notice 95th, 2011, Notice 12th 2013, China State Administration of Work Safety.
- [E] Catalog of Hazardous Chemicals for Environmental Management, Notice 33th 2014, The former Ministry of Environmental Protection.
- [F] List of Various Monitoring Chemicals, 52th 2020, the Ministry of Industry and Information Technology.
- [G] List of Priority Controlled Chemicals (the First batch), 83th 2017, the former Ministry of Environmental Protection, Ministry of Industry and Information Technology, the former National Health And Family Planning Commission.
- [H] Catalog of Specially Controlled Hazardous Chemicals (First Edition), 1st 2020, the Ministry of Emergency Management, Ministry of Industry and Information Technology, Ministry of Public Security, Ministry of Transport.
- [I] List of Toxic and Harmful Water Pollutants (First batch), 28th 2019, the Ministry of Ecology and Environment, National Health Commission.
- [J] Catalog of Highly Toxic Chemicals, Notice 142th 2003, the former Ministry of Health of P.R.China.
- [K] Dangerous Chemicals Directory Used to Manufacture Exploder (2017 Edition), Notice 11th May. 2017, Ministry of Public Security of P.R.China.
- [L] Catalog of Stupefacient and Psychotropic Substances(2013 Edition), Notice 230th 2013, China Food and Drug Administration.
- [M] Catalog of Classification and Varieties of Precursor Chemicals, 120th 2017, series of announcements issued by the Ministry of Public Security and other ministries and commissions.
- [N] Catalog of Import and Export Management of Precursor Chemicals, 7th 2006, the Ministry of Commerce.
- [O] International Verification of Precursor Chemicals Management Catalog, 8th 2006, the Ministry of Commerce, Ministry of Public Security.

Note:

- “√” Indicates that the substance included in the regulations.
- “x” No data or not included in the regulations.

16 Other information

Information on revision

Creation Date	2021/11/18
Revision Date	2021/11/18
Reason for revision	-

Reference

- [1] IPCS: The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>.
- [2] IARC, website: <http://www.iarc.fr/>.
- [3] OECD: The Global Portal to Information on Chemical Substances, website: <https://www.echemportal.org/echemportal/substancesearch/index.action>.
- [4] CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>.
- [5] NLM: ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>.
- [6] EPA: Integrated Risk Information System, website: <http://cfpub.epa.gov/iris/>.
- [7] U.S. Department of Transportation: ERG, website: <http://www.phmsa.dot.gov/hazmat/library/erg>.

[8] Germany GESTIS-database on hazard substance, website: <http://gestis-en.itrust.de/>.

Abbreviations and acronyms

CAS	Chemical Abstracts Service	UN	The United Nations
PC-STEL	Short term exposure limit	OECD	Organization for Economic Co-operation and Development
PC-TWA	Time Weighted Average	IMDG	International Maritime Dangerous Goods
MAC	Maximum Allowable Concentration	IARC	International Agency for Research on Cancer
DNEL	Derived No Effect Level	ICAO	International Civil Aviation Organization
PNEC	Predicted No Effect Concentration	IATA	International Air Transportation Association
NOEC	No Observed Effect Concentration	ACGIH	American Conference of Governmental Industrial Hygienists
LC ₅₀	Lethal Concentration 50%	NFPA	National Fire Protection Association
LD ₅₀	Lethal Dose 50%	NTP	National Toxicology Program
EC ₅₀	Effective Concentration 50%	PBT	Persistent, Bioaccumulative, Toxic
EC _x	Effective Concentration X%	vPvB	very Persistent, very Bioaccumulative
P _{OW}	Partition coefficient Octanol: Water	CMR	Carcinogens, mutagens or substances toxic to reproduction
BCF	Bioconcentration factor	RPE	Respiratory Protective Equipment
ED	Endocrine disruptor		

Disclaimer

This Safety Data Sheet (SDS) was prepared according to GB/T 16483 and GB/T 17519. The data included was derived from international authoritative database and provided by the enterprise. Other information was based on the present state of our knowledge. We try to ensure the correctness of all information. However, due to the diversity of information sources and the limitations of our knowledge, this document is only for user's reference. Users should make their independent judgment of suitability of this information for their particular purposes. We do not assume responsibility for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

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