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Safety Data Sheet

1. Chemical product and company identification

Product name	:	Cobalt, cube, 5N

Company information

Name of manufacturer	:	KANTO CHEMICAL CO., INC.
Address	:	2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP
Name of section	:	Business Administration Department, Reagent Division
Telephone number	:	+81-3-6214-1090
Facsimile number	:	+81-3-3241-1047
Mail address	:	BC32@kanto.co.jp
Reference No	:	08341
Recommended use	:	For research use only
Restrictions on use	:	Seek expert judgment when using the product for applications other than those recommended.

2. Hazards identification

GHS classification

Health hazards	Acute toxicity (oral)	Category 4
	Acute toxicity (inhalation:dust/mist)	Category 1
	Serious eye damage/eye irritation	Category 2B
	Respiratory sensitization	Category 1A
	Skin sensitization	Category 1A
	Carcinogenicity	Category 2
	Reproductive toxicity	Category 1B
	Specific target organ toxicity (single exposure)	Category 1 (respiratory organs)
	Specific target organ toxicity (repeated exposure)	Category 1 (respiratory organs, heart, thyroid, blood, reproductive organs (male))
Environmental hazards	Aquatic acute	Category 1
	Aquatic chronic	Category 1

Hazard pictograms

Signal word : Danger

Hazard statements :
Harmful if swallowed
May cause an allergic skin reaction
Causes eye irritation
Fatal if inhaled
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Suspected of causing cancer

May damage fertility or the unborn child
Causes damage to organs (respiratory organs)
Causes damage to organs (respiratory organs, heart, thyroid, blood, reproductive organs (male)) through prolonged or repeated exposure
Very toxic to aquatic life
Very toxic to aquatic life with long lasting effects

Precautionary statements

Prevention	:	Do not handle until all safety precautions have been read and understood. Do not breathe dust. Wash hands, forearms and face thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. [In case of inadequate ventilation] wear respiratory protection.
Response	:	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. IF ON SKIN: Wash with plenty of water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Call a POISON CENTER or doctor. IF exposed or concerned: Get medical advice/attention. Immediately call a POISON CENTER or doctor. Get medical advice/attention if you feel unwell. Rinse mouth. If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. If experiencing respiratory symptoms: Call a POISON CENTER or doctor. Take off contaminated clothing and wash it before reuse. Collect spillage.
Storage	:	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	:	Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

3. Composition/information on ingredients

Distinction of substance or mixture	:	Substance

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Cobalt	≥ 99.99	Co	Listed	231-158-0	7440-48-4

4. First aid measures

First aid measures

First-aid measures after inhalation : Remove the victim to fresh air, and make him blow his nose and gargle.

First-aid measures after skin contact : Wash the affected areas under running water.

First-aid measures after eye contact : Wash the affected areas under running water.

First-aid measures after ingestion : Give the victim water or salt water and make him vomit. Get medical attention.

Personal Protection in First Aid and Measures : Rescuers should wear proper protective equipment like rubber gloves, goggles.

Most Important Symptoms/Effects

Symptoms/effects : If inhaled dust, causes cough, closeness, shortness of breath, asthma-like reaction. Symptoms may be delayed.

5. Fire fighting measures

Suitable extinguishing media : This product is noncombustible.

Unsuitable extinguishing media : None

Firefighting instructions : Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area.

Personal protection (Emergency response) : Firefighters should wear protective equipment.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures : Wear proper protective equipment and avoid contact with skin and inhalation of dust. Conduct operations from upwind and evacuate people downwind.

Environmental precautions

Environmental precautions : Attention should be given to avoid damage to the environment by flowing of spillage to rivers.

Methods and Equipment for Containment and Cleaning up

For containment : Sweep up in a chemical waste container. Flush contaminated area with copious amounts of water.

7. Handling and storage

Handling

Technical measures : Wear appropriate protective equipment to avoid contact with skin or inhalation of dust.

Precautions for safe handling : Avoid formation of dust and aerosols.

Storage

Storage conditions	:	Store in a dark, cool place and tightly closed.
Material used in packaging/containers	:	Glass, polyethylene, polypropylene.

8. Exposure controls / Personal protection equipment

ACGIH TWA	0.02 mg/m³ (I)

Appropriate engineering controls	:	Install a local ventilation system in case of dusty condition.

Protective equipment

Respiratory protection	:	If necessary, wear dust mask
Hand protection	:	Impervious protective gloves
Eye protection	:	Safety goggles
Skin and body protection	:	Protective clothing, protective boots

9. Physical and chemical properties

Physical state	:	Solid
Color	:	Grayish white - gray
Odor	:	Odorless
pH	:	No data available
Melting point	:	1492 ° C
Freezing point	:	No data available
Boiling point	:	3100 ° C
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability	:	Not flammable.
Vapor pressure	:	No data available
Relative density	:	8.9 (20℃)
Density	:	No data available
Relative gas density	:	No data available
Solubility	:	Water: Insoluble.
Partition coefficient n-octanol/water (log Pow)	:	No data available
Explosive limits (vol %)	:	No data available
Viscosity, kinematic	:	No data available
Particle characteristics	:	No data available

10. Stability and reactivity

Reactivity	:	Easily combines with halogens. Reacts with non-metal carriers such as sulfur and phosphorus.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	When made into a fine powder, it is easily oxidized and may spontaneously ignite. When heated with sulfur, phosphorus, arsenic, antimony, tin, zinc,

		etc, it ignites and reacts.
Conditions to avoid	:	Light, heat.
Incompatible materials	:	Oxidizing substances.
Hazardous decomposition products	:	fume.

11. Toxicological information

Acute toxicity (oral)	:	Harmful if swallowed rat LD50=550mg/kg
Acute toxicity (dermal)	:	Classification not possible
Acute toxicity (inhalation)	:	No classification (gas) Classification not possible (vapor) Fatal if inhaled (dust, mist) rat LC50<0.05mg/L/4h
Skin corrosion/irritation	:	No classification In an in vitro skin irritation test using an artificial skin model in accordance with OECD TG 439, the cell viability rate was 95.1%, and the substance was judged to be out of category.
Serious eye damage/irritation	:	Causes eye irritation In an eye irritation test of the powder of this substance using rabbits in accordance with OECD TG 405, moderate conjunctival redness and mild to moderate scleral redness were observed, which persisted up to 72 hours but disappeared after 7 days. Thus, it was classified into category 2B.
Respiratory sensitization	:	May cause allergy or asthma symptoms or breathing difficulties if inhaled. This substance is designated as group 1 sensitizer (skin, airway) by the Japan Society for Occupational Health. In addition, positive results were reported in an intradermal cobalt chloride-induced skin test on workers engaged in metalworking, etc., who exhibit asthmatic symptoms, and some of them showed positive results in the RAST. Thus, it was classified into category 1A.
Skin sensitization	:	May cause an allergic skin reaction This substance is designated as group 1 sensitizer (skin, airway) by the Japan Society for Occupational Health. In addition, allergic reactions to cobalt have been reported in lathe operators due to occupational exposure. Thus, it was classified into category 1A.
Germ cell mutagenicity	:	Classification not possible As for in vivo, data on cobalt metal are negative in a micronucleus test using peripheral blood erythrocytes from mice exposed by inhalation for 3 months. As for in vitro, data on cobalt metal include positive reports in bacterial reverse mutation tests, but negative reports in recent tests conducted at three different laboratories. Based on the above, there is concern about local effects of cobalt metal, but there are no relevant and appropriate in vivo data, thus the classification is not possible.
Carcinogenicity	:	Suspected of causing cancer According to the existing classifications by domestic and foreign classification organizations, IARC classifies cobalt metal without tungsten carbide as Group 2B, the Japan Society for Occupational Health as Group 2B for cobalt and cobalt compounds (excluding tungsten carbide), and ACGIH as A3 for cobalt and inorganic compounds.

Reproductive toxicity	:	May damage fertility or the unborn child Since this substance was shown to be soluble in artificial gastric juice and artificial lysosomal juice, it was considered possible to classify it based on the data for soluble cobalt compounds. In a study in which male mice were exposed to cobalt chloride in drinking water for 12 weeks and then mated with untreated females, male reproductive toxicity was observed, with an increase in the number of resorptions and females with resorptions, a decrease in the number of live fetuses, and decreased fertility in males. In a developmental toxicity study in female rats in which cobalt sulfate was administered by oral gavage on gestation days 1-21, low body weight, delayed skeletal growth, and increased incidence of malformations were observed in fetuses at dose levels not toxic to dams. Thus, it was classified into category 1B.
STOT-single exposure	:	Causes damage to organs (respiratory organs) It has been reported that healthy volunteers inhaled cemented carbide dust containing an average of 0.038 mg/m3 of this substance for 6 hours and experienced a transient decrease in ventilation that may have been caused by the irritant properties. It has also been reported that in workers exposed to cemented carbide dust, an obstructive disturbance of the airways occurred at an average cobalt concentration of 0.126 mg/m3, and obstruction of the airways and irritation symptoms occurred at 0.06 mg/m3. In addition, it has been reported that in a single inhalation exposure study of this substance in rats, 0.05 mg/L/4 hours caused death in all cases by day 11, and inflammatory edema with neutrophilic granulocytes, lymphocytes, and histiocytes around pulmonary vessels, and interstitial pneumonia were observed. Thus, it was classified into category 1 (respiratory organs).
STOT-repeated exposure	:	Causes damage to organs (respiratory organs, heart, thyroid, blood, reproductive organs (male)) through prolonged or repeated exposure In a study of cobalt smelter workers, dyspnea, wheezing, increased white blood cell count, decreased thyroid hormone T3, red blood cell count, hemoglobin concentration, and hematocrit levels, and increased incidence of abnormal thyroid hormone, cardiac-type creatine kinase activity, white blood cell count and red blood cell count were reported. In a 14-week inhalation exposure study of this substance in mice, lung infiltration, vacuolar degeneration of bronchioles, and squamous metaplasia of the pharynx were observed at 0.000625 mg/L or higher, degeneration of olfactory and respiratory epithelium at 0.00125 mg/L or higher, hyperplasia of bronchioles and respiratory epithelium, and squamous metaplasia of the respiratory epithelium at 0.0025 mg/L or higher, brown lung, alveolar proteinosis, pulmonary megakaryocytes, nasal atrophy, pulmonary hemorrhage, pneumonia, and rhinitis at 0.005 mg/L or higher were observed. In males, decreased sperm motility at 0.0025 mg/L or higher, decreased testicular weight and decreased sperm activity at 0.005 mg/L or higher, and testicular degeneration, cytoplasmic vacuolar degeneration of the epididymis, decreased spermatozoa, and germ cell detachment at 0.01 mg/L or higher were further observed. Thus, it was classified into category 1 (respiratory organs, heart, thyroid, blood, reproductive organs (male)).
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	Very toxic to aquatic life Pseudokirchneriella subcapitata EC50=0.144mg/L/72h
Aquatic chronic	:	Very toxic to aquatic life with long lasting effects Hyalella azteca NOEC=0.00683mg/L/28-day

Persistence and degradability

No additional information available

Bioaccumulative potential

No additional information available

Mobility in soil

No additional information available

Hazardous to the ozone layer

Ozone	:	Classification not possible

13. Disposal considerations

Ecological waste information	:	Solidification method : Solidify with cement and bury in a landfill site approved for hazardous waste disposal. Or entrust approved waste disposal companies with the disposal.
Contaminated container and packaging	:	In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea(IMDG)

UN-No. (IMDG)	:	3288
Proper Shipping Name (IMDG)	:	TOXIC SOLID, INORGANIC, N.O.S.
Packing group (IMDG)	:	I
Transport hazard class(es) (IMDG)	:	6.1

Air transport(IATA)

UN-No. (IATA)	:	3288
Proper Shipping Name (IATA)	:	Toxic solid, inorganic, n.o.s.
Packing group (IATA)	:	I
Transport hazard class(es) (IATA)	:	6.1
Marine pollutant	:	Applicable
MFAG-No	:	151

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other information

Data sources : Encyclopaedia Chimica, Kyoritsu Shuppan Co, Ltd. (1963) .
Handbook of dangeroous and hazardous chemicals, Japan Industrial Safety & Health Association. (2000-2001) .
Handbook of Dangerous Substances Springer-Verlag Tokyo (1991) .
NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully.The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements.The information herein is only provision of information, and it does not represent a guarantee the properties of the product.The Safety Data Sheet(SDS) is prepared based on JIS Z7253.