

CANON OPTRON INC.
 SDS Number: EC03
 Product Name: CeO₂ (A, C)

SAFETY DATA SHEET

rev. 6.5 Date of Issue 2014/9/1
 Revised Date 2018/6/6

SECTION 1 Chemicals and company identification

Chemical identifier	CeO ₂ (A, C)
SDS number	EC03
Company name	CANON OPTRON INC.
Address	1744-1, Kanakubo, Yuki-shi, Ibaraki-ken, 307-0015 Japan
Section name	Internal Control Promotion Div.
Telephone number	+81-296-21-3700 (Sales Dept.)
Fax number	+81-296-21-3770
Emergency telephone number	+81-296-21-3700 (Sales Dept.)
Recommended uses and restrictions on use	Vacuum deposition material

SECTION 2 Hazards identification


GHS Classification (A classification by JIS Z 7252 "classification methods such as chemical substances based on GHS")

Physicochemical hazard	Explosives	Classification not possible
	Flammable gases (including chemically unstable gases)	Not applicable
	Aerosols	Not applicable
	Oxidizing gases	Not applicable
	Gases under pressure	Not applicable
	Flammable liquids	Not applicable
	Flammable solids	Classification not possible
	Self-reactive substances and mixtures	Classification not possible
	Pyrophoric liquids	Not applicable
	Pyrophoric solids	Classification not possible
	Self-heating substances and mixtures	Classification not possible
	Substances and mixtures which, in contact with water, emit flammable gases	Classification not possible
	Oxidizing liquids	Not applicable
	Oxidizing solids	Classification not possible
	Organic peroxides	Classification not possible
	Corrosive to metals	Classification not possible
Health hazard	Acute toxicity (oral)	Not classified
	Acute toxicity (dermal)	Not classified
	Acute toxicity (inhalation)	Not classified
	Skin corrosion/irritation	Not classified

CANON OPTRON INC.
 SDS Number: EC03
 Product Name: CeO₂ (A, C)

SAFETY DATA SHEET

rev. 6.5 Date of Issue 2014/9/1
 Revised Date 2018/6/6

	Eye damage/eye irritation	Not classified
	Respiratory sensitization	Classification not possible
	Skin sensitization	Classification not possible
	Germ cell mutagenicity	Not classified
	Carcinogenicity	Classification not possible
	Reproductive toxicity	Classification not possible
	Effects on or via lactation	Classification not possible
	Specific target organ toxicity(single exposure)	Category 2
	Specific target organ toxicity(repeated exposure)	Category 1
	Aspiration hazard	Classification not possible
Environmental hazard	Hazard to the aquatic environment(acute hazard)	Classification not possible
	Hazard to the aquatic environment(long-term hazard)	Classification not possible
	Hazard to the ozone layer	Classification not possible
Label element		
Pictogram (Symbol)	Health Hazard	
		
Signal word	Danger	
Hazard statement	May cause damage to organs. Causes damage to organs through prolonged or repeated exposure.	
Precautionary statement		
【Safety measures】	Do not breathe dust/fume/gas/mist/vapours/spray. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.	
【First-aid measures】	If exposed or concerned: Call a poison center or doctor/physician. Get medical advice/attention if you feel unwell.	
【Storage】	Store locked up.	
【Disposal】	Dispose of contents/container in accordance with national regulations.	

SECTION 3 Composition and information ingredients

CANON OPTRON INC.
 SDS Number: EC03
 Product Name: CeO2 (A, C)

SAFETY DATA SHEET

rev. 6.5 Date of Issue 2014/9/1
 Revised Date 2018/6/6

Substance/Mixture	Substance
Chemical name or generic name	Cerium oxide
Chemical formula	CeO2
CAS No.	1306-38-3
Concentration or concentration range	99.9%<
TSCA Inventory	Cerium oxide (CeO2)
EINECS number	215-150-4
Radioactive information	It does not use a radioactive substance as a material. Thus, evidence of ionizing radiation occurs is not present.

SECTION 4 First-aid measures

Inhalation	If you feel bad, get medical attention, diagnosis.
Skin	Wash with soap and water. If skin irritation occurs, it is possible to receive medical attention, attention.
Eye	Rinse cautiously with water for several minutes. If eye irritation persists, get medical attention, attention.
Ingestion	Rinse the mouth. If you feel bad, get medical attention, attention.
Protection of first aiders	No data available

SECTION 5 Fire-fighting measures

Extinguishing media	Water spray, foam, dry chemical, carbon dioxide, dry sand such
Extinguishing media are unsuitable	No data available
Specific hazards	Is a non-flammable, itself does not burn, but there is a risk which break down when heated, to generate fumes and toxic or corrosive /. Is likely to generate toxic gases irritating, corrosive and fire.
Specific extinguishing methods	The Move containers from fire area if this can be done without risk. Eliminate all ignition sources if safe to do so.
Protection of fire-fighters	I wear appropriate respiratory air, the protective clothing (heat resistance).

SECTION 6 Accidental release measures

Personal precautions, protective equipment, and emergency procedures	Immediately, I isolate leakage area as the appropriate distance in all directions.
Environmental precautions	It should not be released to the environment.
Methods and materials for containment and methods and materials for cleaning up	Is moistened with water, to prevent the dispersion reduces the dust in the air.
Secondary disaster prevention measures	Was covered with a plastic sheet to prevent scattering.

CANON OPTRON INC.
 SDS Number: EC03
 Product Name: CeO₂ (A, C)

SAFETY DATA SHEET

rev. 6.5 Date of Issue 2014/9/1
 Revised Date 2018/6/6

SECTION 7 Handling and storage precautions

Handling

Technical measures	It does not require technical measures specially.
Safety handling precautions	Do not inhale dust, fumes, vapors, spray. Wash hands thoroughly after handling. When you use this product, you should not eat, drink or smoke.

Storage

Safe storage conditions	To keep it under lock and key.
Safety packaging material	No data available

SECTION 8 Exposure controls and personal protection

CeO₂

Permissible concentration

ACGIH

Not set

Engineering controls

The workshop handling or storage of this material, it is recommended that you install the appropriate safety shower and eye wash.
 In order to prevent the exposure, it is recommended that you install the appropriate general ventilation equipment, local exhaust ventilation in the workplace.

Personal protective equipment

Respiratory protection	Dust mask
Hand protection	Protective glove
Eye protection	Dust-proof glasses
Skin and body protection	Protective clothing

SECTION 9 Physical and chemical properties

Appearance

Physical state	Solid
Form	Pellets, granules
Colour	Pale yellow
Odour	None

CeO₂

pH	<i>No data available</i>
Melting point/Freezing point	2480°C
Boiling point/Initial boiling point and boiling range	3730°C
Flash point	<i>No data available</i>
Evaporation rate	<i>No data available</i>

CANON OPTRON INC.
 SDS Number: EC03
 Product Name: CeO₂ (A, C)

SAFETY DATA SHEET

rev. 6.5 Date of Issue 2014/9/1
 Revised Date 2018/6/6

Flammability (solid, gas)	<i>No data available</i>
Explosive limits	
LEL	<i>No data available</i>
UEL	<i>No data available</i>
Vapour pressure	<i>No data available</i>
Vapour density (air = 1)	<i>No data available</i>
Specific gravity (Relative density)	7.21
(Density)	※ 4.0 ~ 4.4 (pellet) CeO ₂ (A, C) as
Solubility	
Water	<i>Insoluble</i>
Other solvents	<i>And insoluble in solvents</i>
n-octanol/Water partition coefficient	<i>No data available</i>
Auto-ignition temperature	<i>No data available</i>
Decomposition temperature	<i>No data available</i>
Viscosity (Coefficient of viscosity)	<i>No data available</i>
Other data	<i>None</i>

SECTION 10 Stability and reactivity

CeO₂

Reactivity	<i>No data available</i>
Chemical stability	<i>I is considered stable.</i>
Hazardous reactions	<i>Do not react in the storage conditions and normal handling. I will generate NO_x gas in the reaction of chlorine gas, and nitric acid reaction with hydrochloric acid.</i>
Conditions to avoid	<i>High-temperature and humidity</i>
Incompatible materials	<i>Carbon dioxide, acid</i>
Hazardous decomposition products	<i>Acid mist is generated upon dissolution of the acid.</i>

SECTION 11 Hazard information

CeO₂

Acute toxicity(oral)	<i>Rat LD50 value:> 5000 mg / kg bw (IUCALID (2000))</i>
Acute toxicity(dermal)	<i>Not died in administration ((2000) IUCALID), of 2000 mg / kg bw> 2000mg/kg bw: rat LD50 value.</i>
Acute toxicity(inhalation)	<i>It is solid in the definition of GHS: (gas) inhalation. Inhalation (vapor): No data Inhalation (dust): rat LC50 value:> 5.05 mg / L (OECD TG403) (IUCALID (2000)). In addition, I have applied the reference value of the dust from the description (IUCALID (2000)) and which accounts for 85.4% 3 micron particles.</i>

CANON OPTRON INC.

SDS Number: EC03
Product Name: CeO₂ (A, C)

SAFETY DATA SHEET

rev. 6.5 Date of Issue 2014/9/1
Revised Date 2018/6/6

Skin corrosion/irritation	<i>Test applied the test substance 0.5g to rabbit in (OECD TG404) and in another study using a rabbit without irritating 0.0 without irritating (not irritating), primary skin irritation index (not irritating) (IUCRID (2000)).</i>
Eye damage/eye irritation	<i>Test applied the test substance 0.1g in the eyes of rabbits in (OECD TG405), No irritation and In another study using a rabbit (not irritating) (IUCRID (2000)), slightly irritating (slightly irritating) (IUCRID (2000)).</i>
Respiratory sensitization/Skin sensitization	<i>Maximization test using guinea pig sensitization reaction was not observed in induced after (OECD TG406), No sensitization (Not sensitizing.) (IUCRID (2000)).</i>
Germ cell mutagenicity	<i>Micronucleus test using bone marrow cells by oral administration of mouse (OECD TG474) is (somatic cell in vivo mutagenicity test) negative (IUCRID (2000)). In addition, in vitro studies, the results of Emusutesuto negative (Volume 8 Ministry of the Environment Risk Assessment (2010)).</i>
Carcinogenicity	<i>Under the risk assessment guidelines for carcinogenicity, to evaluate the carcinogenic potential in humans data are insufficient to US EPA (IRIS (2009) Tox Review).</i>
Reproductive toxicity	<i>No data available</i>
Specific target organ toxicity(single exposure)	<i>In disturbance of the hair and labored breathing, the lungs of all patients in 2/10 animals; (GLP 433 OECD TG) study in 4-hour inhalation exposure concentration of 4.12 ~ 5.98 mg / L a (dust) in the rat was observed incomplete collapse accompanied by whitish lesions of diffuse (IUCRID (2000)). It should be noted that in the oral study, rather than killed in administration of 5000 mg / kg bw in rats showed normal weight gain, no abnormality seen at autopsy (IUCRID (2000)).</i>
Specific target organ toxicity(repeated exposure)	<i>Accumulation of rare earth elements was observed in the lungs of workers has received over the years the exposure of the rare-earth element fumes such as cerium, a decrease in vital capacity and lung lesions of fibrosis granuloma, emphysema, interstitial been reported you are (Volume 8 Ministry of the Environment Risk Assessment (2010)).In addition, pulmonary obstruction and pleural thickening mild seen in the 58-year-old man after a lapse of more than 15 years at least after exposure to cerium oxide abrasive, and was referred for dyspnea, the results of the pathological examination, chronic pachypleuritis 68 rare earth pneumoconiosis that is engaged in polishing work of the optical lens ((2010) Vol. 8 Ministry of the Environment risk assessment), 35-year case you are diagnosed with, related to the exposure of cerium oxide in after '13 turnover after it was found there is a report (PATTY (5th, 2001)) of cases-year-old man. These cases are an indication of the residual long-term in the lungs of rare earth elements, reporting of adverse events to be exposure of cerium oxide is involved are many. On the other hand, in 13-week repeated inhalation test with dust exposure, expansion of the diaphragm nearly half of 5 mg/m³ or more, fading in the autopsy, changes in the bronchial lymph nodes in all cases, lung in all animals of 51mg/m³ or more rats fading, in histology, pigmentation and lymphatic tissue hyperplasia in the bronchial lymph nodes of male and female of 5 mg/m³ or more, pigmentation in the lungs, hyperplasia of alveolar epithelium in the lungs of male and female of 51 mg/m³ or more, in the pharynx pigmentation and metaplasia were observed, respectively (Volume 8 Ministry of the Environment risk Assessment (2010)).</i>
Aspiration hazard	<i>No data available</i>
Others	<i>None</i>

SECTION 12 Ecological information

CeO₂

Ecotoxicity

Fish

No data available

CANON OPTRON INC.

SDS Number: EC03
Product Name: CeO2 (A, C)

SAFETY DATA SHEET

rev. 6.5 Date of Issue 2014/9/1
Revised Date 2018/6/6

Crustaceantoxicity(single exposure)	No data available
Algae	No data available
Other organisms	No data available
Persistence and degradability	No data available
Bioaccumulative potential	No data available
Mobility in soil	No data available
Hazard to the ozone layer	No data available
Others	No data available

SECTION 13 Notes on disposal

Waste from residues	Entrust the process to industrial waste disposal contractor has received a license from the governor.
Contaminated container and contaminated packaging	Recycle or in the clean container and take appropriate disposal in accordance with the criteria of the relevant legislation sequence municipality.

SECTION 14 Transport information

CeO2

International regulation	
UN classification	Not applicable
UN number	None
UN proper shipping name	None
Packing group	Not applicable
Japanese laws and regulations	None
Conditions and specific safety measures of transport	Requires retention of yellow card when transporting. Do not transport with food and feedstuffs. During transport, I avoid direct rays of the sun, the loading of container damage, corrosion, so that there is no leakage, it is surely the prevention of collapse of cargo. Do not top up heavy objects.

SECTION 15 Regulatory information (Japan)

CeO2

PRTR Law	No data available
Occupational Safety and Health Law	No data available
Poisonous and Deleterious Substances control Law	No data available
Explosives control Law	No data available
High-pressure gas security Law	No data available

CANON OPTRON INC.

SDS Number: EC03
 Product Name: CeO2 (A, C)

SAFETY DATA SHEET

rev. 6.5 Date of Issue 2014/9/1
 Revised Date 2018/6/6

Fire fighting Law	<i>No data available</i>
Chemical substances control Law	<i>No data available</i>
Ship safety Law	<i>No data available</i>
Aviation Law	<i>No data available</i>
Prevention of marine pollution Law	<i>No data available</i>
Pneumoconiosis Law	<i>No data available</i>

Note Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

SECTION 16 Other information

The Safety Data Sheet (SDS) has been prepared based on currently available materials, information and data, and may be revised based on new information. Further, the important points in the SDS are made for the purpose of normal handling. When handling the user product in a specialized manner, take the appropriate safety measures for the application or method. Further, Canon Optron Inc. has paid sufficient attention to the described contents of the SDS, but does not guarantee the accuracy of its contents.

Literature Reference

[References]

Industrial Safety and Health Act All Data of MSDS Target Substances: The Chemical Daily Co., Ltd (2003)
 Poisonous and Deleterious Substances Control Act All Data of MSDS Target Substances: The Chemical Daily Co., Ltd (2003)
 Pollutant Release and Transfer Register All Data of MSDS Target Substances: The Chemical Daily Co., Ltd (2003)
 Recommendations for Allowable Concentrations (Fiscal 2017): Japan Society for Occupational Health Journal of Occupational Health, Vol. 59 2017

[WEB site]

National Institute of Technology and Evaluation Homepage
 Japan Advanced Information Center of Safety and Health Homepage
 Ministry of Health, Labour and Welfare Homepage

[Regulatory review Tools]

ezCRIC (Japan Chemical Database Ltd)