

CANON OPTRON INC.

SDS Number: EC03-2  
 Product Name: CeO2 (B, D)

# 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	CeO2 (B, D)
SDS number	EC03-2
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)
Acute toxicity (dermal)		Classification not possible
Acute toxicity (inhalation)		Classification not possible
Skin corrosion/irritation		Classification not possible

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	Eye damage/eye irritation	Classification not possible
	Respiratory sensitization	Classification not possible
	Skin sensitization	Classification not possible
	Germ cell mutagenicity	Classification not possible
	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

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Substance/Mixture	Mixture	
Chemical name or generic name	<i>Cerium oxide</i>	<i>Aluminium oxide</i>
Chemical formula	<i>CeO<sub>2</sub></i>	<i>Al<sub>2</sub>O<sub>3</sub></i>
CAS No.	<i>1306-38-3</i>	<i>1344-28-1</i>
Concentration or concentration range	CeO <sub>2</sub> : 97.0- 99.9 Al <sub>2</sub> O <sub>3</sub> : 0.1-3.0	
TSCA Inventory	<i>Cerium oxide (CeO<sub>2</sub>)</i>	<i>Aluminum oxide (Al<sub>2</sub>O<sub>3</sub>)</i>
EINECS number	<i>215-150-4</i>	<i>215-691-6</i>
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	It is possible to move to fresh air victim immediately and keep at rest in a position comfortable for breathing. If you feel bad, you should contact your doctor.
Skin	Take off all contaminated clothing immediately Remove /. I flush for 15 minutes or more with soap and plenty of water. If symptoms blisters and pain comes, get medical attention if necessary.
Eye	Be flush eyes for at least 15 minutes with clean water immediately. If you are using the contact lenses, as long as it is not fixed, it can be washed and removed. Be subject to medical attention without fail.
Ingestion	Rinse mouth immediately. Be subject to medical attention without fail.
Protection of first aiders	Rescuers Wear protective equipment protective eyewear, such as protective gloves.

## SECTION 5 Fire-fighting measures

Extinguishing media	The product itself does not burn.
Extinguishing media are unsuitable	No data available
Specific hazards	No data available
Specific extinguishing methods	The movable container, and transferred to a safe place as soon as possible in case of surrounding fire.
Protection of fire-fighters	In fire fighting, I want to wear (gloves, glasses, mask) the appropriate protective equipment.

## SECTION 6 Accidental release measures

Personal precautions, protective equipment, and emergency procedures	Wear it (which specify what suited the nature of the product) protective equipment, such as spray or on skin, we do not want to dust inhalation, the gas at the time of work.
Environmental precautions	Do not flowing in rivers and sewage directly spillage.

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Methods and materials for containment and methods and materials for cleaning up

And collected in drums or paper bags are collected to wear or have rake those leaked.

I to absorb in saw-dust or sediment residue content of the small amount of recovery after.

Secondary disaster prevention measures

No data available

## SECTION 7 Handling and storage precautions

### Handling

Technical measures

I wear the appropriate protective equipment safety glasses, protective gloves, etc.. After handling Wash hands, face, etc., and gargle.

Safety handling precautions

When handling, to handle in place with equipment for general ventilation or local exhaust under.

### Storage

Safe storage conditions

Store tightly closed container in a well-ventilated place.

Safety packaging material

No data available

## SECTION 8 Exposure controls and personal protection

CeO<sub>2</sub>

Al<sub>2</sub>O<sub>3</sub>

Permissible concentration

ACGIH

*Not set*

*(Particulate asbestos-free, less than 1% crystalline silica) TLV-TWA 10mg/m<sup>3</sup> (2005 edition)*

Engineering controls

To use devices that are sealed as much as possible, local exhaust ventilation or equipment.

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

CeO<sub>2</sub>

Al<sub>2</sub>O<sub>3</sub>

pH

*No data available*

*No data available*

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Melting point/Freezing point	2480°C	2072°C
Boiling point/Initial boiling point and boiling range	3730°C	2980°C
Flash point	No data available	Noncombustibility
Evaporation rate	No data available	Not applicable
Flammability (solid, gas)	No data available	Noncombustibility
Explosive limits		
LEL	No data available	No data available
UEL	No data available	No data available
Vapour pressure	No data available	0.073Pa (mp.)
Vapour density (air = 1)	No data available	No data available
Specific gravity (Relative density)	7.21	3.97
(Density)	※ CeO <sub>2</sub> 4.1 ~ 4.95 (pellet) (B, D) as	
Solubility		
Water	Insoluble	Insoluble
Other solvents	And insoluble in solvents	The slightly soluble in non-polar organic solvent
n-octanol/Water partition coefficient	No data available	No data available
Auto-ignition temperature	No data available	Noncombustibility
Decomposition temperature	No data available	No data available
Viscosity (Coefficient of viscosity)	No data available	No data available
Other data	None	None

## SECTION 10 Stability and reactivity

	<u>CeO<sub>2</sub></u>	<u>Al<sub>2</sub>O<sub>3</sub></u>
Reactivity	No data available	No data available
Chemical stability	I is considered stable.	Stability
Hazardous reactions	Do not react in the storage conditions and normal handling. I will generate NO <sub>x</sub> gas in the reaction of chlorine gas, and nitric acid reaction with hydrochloric acid.	Almost no
Conditions to avoid	High-temperature and humidity	Generation of dust, diffusion.
Incompatible materials	Carbon dioxide, acid	None
Hazardous decomposition products	Acid mist is generated upon dissolution of the acid.	None

## SECTION 11 Hazard information

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	<u>CeO2</u>	<u>Al2O3</u>
Acute toxicity(oral)	Rat LD50 value:> 5000 mg / kg bw (IUCLID (2000))	Oral Rat LD50> 5000mg/kg
Acute toxicity(dermal)	Not died in administration ((2000) IUCLID), of 2000 mg / kg bw> 2000mg/kg bw: rat LD50 value.	No data available
Acute toxicity(inhalation)	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) (IUCLID (2000)). In addition, I have applied the reference value of the dust from the description (IUCLID (2000)) and which accounts for 85.4% 3 micron particles.	Mouse LD50:> 3,600 mg / kg (ip)
Skin corrosion/irritation	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) (IUCLID (2000)).	No data available
Eye damage/eye irritation	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) (IUCLID (2000)), slightly irritating (slightly irritating) (IUCLID (2000)).	No data available
Respiratory sensitization/Skin sensitization	Maximization test using guinea pig sensitization reaction was not observed in induced after (OECD TG406), No sensitization (Not sensitizing.) (IUCLID (2000)).	No data available
Germ cell mutagenicity	Micronucleus test using bone marrow cells by oral administration of mouse (OECD TG474) is (somatic cell in vivo mutagenicity test) negative (IUCLID (2000)). In addition, in vitro studies, the results of Emusutesuto negative (Volume 8 Ministry of the Environment Risk Assessment (2010)).	Was mutagenicity test has not been carried out, even in the mutagenicity test Ames test is only the (negative), and can not be classified by the lack of data. Was mutagenicity test has not been carried out, even in the mutagenicity test Ames test is only the (negative), and can not be classified by the lack of data.
Carcinogenicity	Under the risk assessment guidelines for carcinogenicity, to evaluate the carcinogenic potential in humans data are insufficient to US EPA (IRIS (2009) Tox Review).	ACGIH are classified into (a substance that can not be classified as a human carcinogen) group A4.
Reproductive toxicity	No data available	No data available

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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 (IUCLID (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 (IUCLID (2000)).</i>	<i>May cause respiratory irritation</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/m<sup>3</sup> or more, fading in the autopsy, changes in the bronchial lymph nodes in all cases, lung in all animals of 51mg/m<sup>3</sup> or more rats fading, in histology, pigmentation and lymphatic tissue hyperplasia in the bronchial lymph nodes of male and female of 5 mg/m<sup>3</sup> or more, pigmentation in the lungs, hyperplasia of alveolar epithelium in the lungs of male and female of 51 mg/m<sup>3</sup> or more, in the pharynx pigmentation and metaplasia were observed, respectively (Volume 8 Ministry of the Environment risk Assessment (2010)).</i>	<i>TLV-TWA 10mg/m<sup>3</sup>(An asbestos non-implication, the fine particles of under crystal silica 1%) (A 2005 version)</i>
Aspiration hazard	<i>No data available</i>	<i>TLV-TWA 10mg/m<sup>3</sup>(An asbestos non-implication, the fine particles of under crystal silica 1%) (A 2005 version)</i>
Others	None	

## SECTION 12 Ecological information

	<b><u>CeO<sub>2</sub></u></b>	<b><u>Al<sub>2</sub>O<sub>3</sub></u></b>
Ecotoxicity		
Fish	<i>No data available</i>	<i>No data available</i>

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

	<u>CeO<sub>2</sub></u>	<u>Al<sub>2</sub>O<sub>3</sub></u>
International regulation		
UN classification	Not applicable	Not applicable
UN number	None	None
UN proper shipping name	None	None
Packing group	Not applicable	Not applicable
Japanese laws and regulations	None	No land Regulatory Information Regulatory Maritime regulatory information non-hazardous materials Aviation regulatory information non-hazardous materials
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.	During transport, the loading container is broken or corroded, so that there is no leak, and to reliably prevent the collapse of cargo.

## SECTION 15 Regulatory information (Japan)

	<u>CeO<sub>2</sub></u>	<u>Al<sub>2</sub>O<sub>3</sub></u>
PRTR Law	No data available	None
Occupational Safety and Health Law	No data available	There is it in the case of an application or an application



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Poisonous and Deleterious Substances control Law	<i>No data available</i>	<i>None</i>
Explosives control Law	<i>No data available</i>	<i>None</i>
High-pressure gas security Law	<i>No data available</i>	<i>None</i>
Fire fighting Law	<i>No data available</i>	<i>None</i>
Chemical substances control Law	<i>No data available</i>	<i>None</i>
Ship safety Law	<i>No data available</i>	<i>None</i>
Aviation Law	<i>No data available</i>	<i>None</i>
Prevention of marine pollution Law	<i>No data available</i>	<i>None</i>
Pneumoconiosis Law	<i>No data available</i>	<i>There is it in the case of an application or an application</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)