

CANON OPTRON INC.

SDS Number: ET04
Product Name: TiO2

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	TiO2
SDS number	ET04
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: ET04
Product Name: TiO2

SAFETY DATA SHEET

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

	Eye damage/eye irritation	Category 2B
	Respiratory sensitization	Classification not possible
	Skin sensitization	Classification not possible
	Germ cell mutagenicity	Not classified
	Carcinogenicity	Category 2
	Reproductive toxicity	Classification not possible
	Effects on or via lactation	Classification not possible
	Specific target organ toxicity(single exposure)	Classification not possible
	Specific target organ toxicity(repeated exposure)	Classification not possible
	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	Warning	
Hazard statement	Causes eye irritation. Suspected of causing cancer.	
Precautionary statement		
【Safety measures】	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wash hands thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection.	
【First-aid measures】	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: Get medical advice/attention. If eye irritation persists: Get medical advice/attention.	
【Storage】	Store locked up.	
【Disposal】	Dispose of contents/container in accordance with national regulations.	

CANON OPTRON INC.

SDS Number: ET04
 Product Name: TiO2

SAFETY DATA SHEET

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

SECTION 3 Composition and information ingredients

Substance/Mixture	Substance
Chemical name or generic name	<i>Titanium oxide</i>
Chemical formula	<i>TiO2</i>
CAS No.	<i>13463-67-7</i>
Concentration or concentration range	99.9<
TSCA Inventory	<i>Titanium oxide (TiO2)</i>
EINECS number	<i>236-675-5</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	If you feel bad, get medical attention, attention.
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. Then, be removed, if present and easy to do wear contact lenses. To continue the cleaning afterwards. 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	Rod-like drainage
Specific hazards	Is a non-flammable, itself does not burn, but there is a risk which break down when heated, to generate fumes of toxic and 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.
Protection of fire-fighters	wear appropriate respiratory air, the protective clothing (heat resistance).

SECTION 6 Accidental release measures

Personal precautions, protective equipment, and emergency procedures	I remove all ignition sources.
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.

CANON OPTRON INC.

SDS Number: ET04
Product Name: TiO2

SAFETY DATA SHEET

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

Secondary disaster prevention measures	Was covered with a plastic sheet to prevent scattering.
--	---

SECTION 7 Handling and storage precautions

Handling

Technical measures	And made capital measures described in "SECTION 8 Exposure controls and personal protection", to wear protective equipment.
Safety handling precautions	Wash hands thoroughly after handling. When you use this product, you should not eat, drink or smoke. Be sure to get the instruction manual before use. Do not handle until you read and understand all safety precautions. Do not get in eyes.

Storage

Safe storage conditions	Be stored in a cold dry plants and container tightly closed. To keep it under lock and key.
Safety packaging material	No data available

SECTION 8 Exposure controls and personal protection

TiO2

Permissible concentration

ACGIH

<i>TWA 10 mg/m3 (2009 edition)</i>
--

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	Blue black or white
Odour	None

TiO2

pH

<i>In (1 IN 10) litmus paper SUSPENSION IN WATER neutral: HSDB (2005)</i>

Melting point/Freezing point

<i>1855°C</i>

CANON OPTRON INC.

SDS Number: ET04
Product Name: TiO2

SAFETY DATA SHEET

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

Boiling point/Initial boiling point and boiling range	2500~3000°C
Flash point	Noncombustibility
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Explosive limits	
LEL	Not explode
UEL	Not explode
Vapour pressure	No data available
Vapour density (air = 1)	No data available
Specific gravity (Relative density)	4.23
(Density)	※ as TiO ₂ , (bulk density of the granular product) from 2.10 to 2.45
Solubility	
Water	Insoluble
Other solvents	Organic solvents: insoluble
n-octanol/Water partition coefficient	No data available
Auto-ignition temperature	No data available
Decomposition temperature	1860°C : Sax (11th, 2004)
Viscosity (Coefficient of viscosity)	No data available
Other data	None

SECTION 10 Stability and reactivity

TiO₂

Reactivity	No data available
Chemical stability	It is considered to be stable in storage and handling in accordance with the laws and regulations
Hazardous reactions	No data available
Conditions to avoid	No data available
Incompatible materials	No data available
Hazardous decomposition products	No data available

SECTION 11 Hazard information

TiO₂

Acute toxicity(oral)	Rat LD ₅₀ > 20000mg/kg
Acute toxicity(dermal)	Rabbit approxLD ₅₀ > 10000mg/kg
Acute toxicity(inhalation)	Rat LC> 6.82mg/L/4h

CANON OPTRON INC.

SDS Number: ET04
Product Name: TiO2

SAFETY DATA SHEET

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

Skin corrosion/irritation	<i>Mild irritation at the application 0.5g, 24-hour test using rabbit</i>
Eye damage/eye irritation	<i>Mild irritation at the test using rabbit</i>
Respiratory sensitization/Skin sensitization	<i>Result of no sensitization skin sensitization test using guinea pigs (Maurer optimisation test).</i>
Germ cell mutagenicity	<i>Described (NTPDB (2005)) negative (both in vivo somatic cell mutagenicity test) in the chromosome aberration test and bone marrow cell micronucleus test by intraperitoneal administration of mouse</i>
Carcinogenicity	<i>(IARC Monograph Vol.93, in preparation) that are classified as Group 2B merged with (particle size 10–50nm) ultra-fine titanium oxide in the IARC. It should be noted that in the feeding study of 103 weeks in mice and rats, and, using the mouse and rat ((1979) NTP TR No.97) both animal species also has been concluded that there is no carcinogenic to the substance have an increased incidence of lung tumors by inhalation of ultrafine titanium oxide, was not observed in mice has been observed in the rat (PATTY (5th, 2001)). On the other hand, in the case of humans by the results of epidemiological studies or case reports of multiple, clear evidence of an association with this substance has not been shown (IARC 47 (1989), ACGIH (2001), HSDB (2005)).</i>
Reproductive toxicity	<i>No data available</i>
Specific target organ toxicity(single exposure)	<i>20000 mg / kg or more (DFGOT (1991)) is, has been considered intake of this substance is substantially non-toxic in humans further, 1 pound lethal dose by oral administration in rats (453.6 g: as the human body weight 60kg without showing a hazard by intake of 7560 mg / kg), it is described (ACGIH (2001)) and was excreted in the feces within 24 hours. In addition, there is no specific data is described Hyuumu of the irritating to the respiratory tract (HDSB (2005)).</i>
Specific target organ toxicity(repeated exposure)	<i>In the study of one of the four trials 103 -week dietary administration or 13 weeks in rats and mice , there is no impact to be due to exposure at a dose of (1250 mg / kg / day) 25000 ppm exceed the guidance value upper limit (NTP TR No.97 (1979)). On the other hand , it is very little labor who have occupational exposure for more than 20 years , it is not accompanied by changes in lung function, but pneumoconiosis changes were revealed by X-ray inspection (DFGOTvol.2 (1991)) there is a description of and , but epidemiological study with the primary study objective titanium oxide is whether it has a fibrotic action is carried out a number , the majority of the association between pulmonary fibrosis and this substance a negative causal relationship hard evidence shown has not been found (DFGOTvol.2 (1991), ACGIH (2001), IARC vol. 47 (1989), PATTY (5th, 2001)). And , by a two -year inhalation exposure , (6 h / day 5 days / week: dust) 250 mg/m3 exceeding the guidance value upper limit on the rat significant impact has not been observed even at a concentration of (IUCLID (2000)) .</i>
Aspiration hazard	<i>No data available</i>
Others	<i>None</i>

SECTION 12 Ecological information

TiO2

Ecotoxicity	
Fish	<i>Medaka fish toxicity LC50/48H:> 20mg / L</i>
Crustaceantoxicity(single exposure)	<i>No data available</i>
Algae	<i>No data available</i>
Other organisms	<i>No data available</i>

CANON OPTRON INC.

SDS Number: ET04
Product Name: TiO2

SAFETY DATA SHEET

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

Persistence and degradability	<i>No data available</i>
Bioaccumulative potential	<i>There is no degradation by microorganisms in the body of fish and shellfish, there is no accumulation of one or. Bioaccumulation. Or material is determined low, that it is not a 2. Highly concentrated property. (CSCL existing inspection)</i>
Mobility in soil	<i>No data available</i>
Hazard to the ozone layer	<i>No data available</i>
Others	<i>Bioaccumulation (magnification) carp; <1.1 to 9.6 times (2mg / L), carp; <10 times (0.2mg / L)</i>

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

TiO2

International regulation	
UN classification	<i>Not applicable</i>
UN number	<i>None</i>
UN proper shipping name	<i>None</i>
Packing group	<i>Not applicable</i>
Japanese laws and regulations	<i>Not land regulation information: N Not applicable maritime regulatory information Not applicable aviation regulations information</i>
Conditions and specific safety measures of transport	<i>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.</i>

SECTION 15 Regulatory information (Japan)

TiO2

PRTR Law	<i>None</i>
Occupational Safety and Health Law	<i>There is it in the case of an application or an application</i>
Poisonous and Deleterious Substances control Law	<i>None</i>
Explosives control Law	<i>None</i>
High-pressure gas security Law	<i>None</i>
Fire fighting Law	<i>None</i>

CANON OPTRON INC.

SDS Number: ET04
Product Name: TiO2

SAFETY DATA SHEET

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

Chemical substances control Law	<i>None</i>
Ship safety Law	<i>None</i>
Aviation Law	<i>None</i>
Prevention of marine pollution Law	<i>None</i>
Pneumoconiosis Law	<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)