

CANON OPTRON INC.

SDS Number: E006
 Product Name: OH-5(A)

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 | OH-5(A) |
| SDS number | E006 |
| 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) | Classification not possible |
| | | 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 | Category 2B |
| | Respiratory sensitization | Classification not possible |
| | Skin sensitization | Classification not possible |
| | Germ cell mutagenicity | Classification not possible |
| | 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. | |

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SECTION 3 Composition and information ingredients

| Substance/Mixture | Mixture | |
|--------------------------------------|--|------------------------------|
| Chemical name or generic name | <i>Zirconium oxide</i> | <i>Titanium oxide</i> |
| Chemical formula | <i>ZrO2</i> | <i>TiO2</i> |
| CAS No. | <i>1314-23-4</i> | <i>13463-67-7</i> |
| Concentration or concentration range | ZrO2 : 88- 94 TiO2 : 6- 12 | |
| TSCA Inventory | <i>Zirconium oxide (ZrO2)</i> | <i>Titanium oxide (TiO2)</i> |
| EINECS number | <i>215-227-2</i> | <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 | 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 emergencyprocedures | 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.
 Should be stored separately (Al, Ca, Mg, K, Na, Zn, and Li) with strong acids, metals.

Safety packaging material

No data available

SECTION 8 Exposure controls and personal protection

ZrO2

TiO2

Permissible concentration

ACGIH

*TWA 5 mg/m3 (as Zr)
 STEL 10 mg/m3 (as Zr)
 (2005 edition)*

*TWA 10 mg/m3
 (2009 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

Ash gray or black

Odour

None

ZrO2

TiO2

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| | | |
|---|--|---|
| pH | <i>No data available</i> | <i>In (1 IN 10) litmus paper SUSPENSION IN WATER neutral: HSDB (2005)</i> |
| Melting point/Freezing point | <i>2700°C</i> | <i>1855°C</i> |
| Boiling point/Initial boiling point and boiling range | <i>4300°C</i> | <i>2500~3000°C</i> |
| Flash point | <i>None</i> | <i>Noncombustibility</i> |
| Evaporation rate | <i>No data available</i> | <i>No data available</i> |
| Flammability (solid, gas) | <i>No data available</i> | <i>No data available</i> |
| Explosive limits | | |
| LEL | <i>None</i> | <i>Not explode</i> |
| UEL | <i>None</i> | <i>Not explode</i> |
| Vapour pressure | <i>No data available</i> | <i>No data available</i> |
| Vapour density (air = 1) | <i>No data available</i> | <i>No data available</i> |
| Specific gravity (Relative density) (Density) | <i>5.73</i> | <i>4.23</i> |
| | <i>※ as OH-5, 4.30 ~ 5.15 (pellet)</i> | |
| Solubility | | |
| Water | <i>Insoluble</i> | <i>Insoluble</i> |
| Other solvents | <i>No data available</i> | <i>Organic solvents: insoluble</i> |
| n-octanol/Water partition coefficient | <i>No data available</i> | <i>No data available</i> |
| Auto-ignition temperature | <i>No data available</i> | <i>No data available</i> |
| Decomposition temperature | <i>No data available</i> | <i>1860°C : Sax (11th, 2004)</i> |
| Viscosity (Coefficient of viscosity) | <i>No data available</i> | <i>No data available</i> |
| Other data | <i>None</i> | <i>None</i> |

SECTION 10 Stability and reactivity

| | <u>ZrO₂</u> | <u>TiO₂</u> |
|----------------------------------|--|--|
| Reactivity | <i>No data available</i> | <i>No data available</i> |
| Chemical stability | <i>It is stable in storage conditions and normal handling.</i> | <i>It is considered to be stable in storage and handling in accordance with the laws and regulations</i> |
| Hazardous reactions | <i>No data available</i> | <i>No data available</i> |
| Conditions to avoid | <i>Heating, sunlight</i> | <i>No data available</i> |
| Incompatible materials | <i>Strong oxidant</i> | <i>No data available</i> |
| Hazardous decomposition products | <i>No data available</i> | <i>No data available</i> |

SECTION 11 Hazard information

ZrO₂TiO₂

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| | | |
|---|---|--|
| Acute toxicity(oral) | No data available | Rat LD50> 20000mg/kg |
| Acute toxicity(dermal) | No data available | Rabbit approxLD50> 10000mg/kg |
| Acute toxicity(inhalation) | Intraperitoneal – Mouse LD50: 87mg/kg | Rat LC> 6.82mg/L/4h |
| Skin corrosion/irritation | If inhaled, to stimulate the respiratory system and mucous membranes. | Mild irritation at the application 0.5g, 24-hour test using rabbit |
| Eye damage/eye irritation | No data available | Mild irritation at the test using rabbit |
| Respiratory sensitization/Skin sensitization | No data available | Result of no sensitization skin sensitization test using guinea pigs (Maurer optimisation test). |
| Germ cell mutagenicity | No data available | 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 |
| Carcinogenicity | No data available | (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)). |
| Reproductive toxicity | No data available | No data available |
| Specific target organ toxicity(single exposure) | No data available | 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)). |

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toxicity(repeated exposure)

No data available

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 (IUCRID (2000)).

Aspiration hazard

No data available

No data available

Others

None

SECTION 12 Ecological information

| | <u>ZrO₂</u> | <u>TiO₂</u> |
|-------------------------------------|------------------------|---|
| Ecotoxicity | | |
| Fish | No data available | Medaka fish toxicity LC50/48H:> 20mg / L |
| 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 | 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) |
| Mobility in soil | No data available | No data available |
| Hazard to the ozone layer | No data available | No data available |
| Others | No data available | Bioaccumulation (magnification) carp; <1.1 to 9.6 times (2mg / L), carp; <10 times (0.2mg / L) |

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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>ZrO₂</u> | <u>TiO₂</u> |
|--|--------------------------|--|
| International regulation | | |
| UN classification | <i>Not applicable</i> | <i>Not applicable</i> |
| UN number | <i>None</i> | <i>None</i> |
| UN proper shipping name | <i>None</i> | <i>None</i> |
| Packing group | <i>Not applicable</i> | <i>Not applicable</i> |
| Japanese laws and regulations | <i>None</i> | <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>No data available</i> | <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)

| | <u>ZrO₂</u> | <u>TiO₂</u> |
|--|--|--|
| PRTR Law | <i>None</i> | <i>None</i> |
| Occupational Safety and Health Law | <i>There is it in the case of an application or an application</i> | <i>There is it in the case of an application or an application</i> |
| Poisonous and Deleterious Substances control Law | <i>None</i> | <i>None</i> |
| Explosives control Law | <i>None</i> | <i>None</i> |
| High-pressure gas security Law | <i>None</i> | <i>None</i> |
| Fire fighting Law | <i>None</i> | <i>None</i> |
| Chemical substances control Law | <i>None</i> | <i>None</i> |
| Ship safety Law | <i>None</i> | <i>None</i> |
| Aviation Law | <i>None</i> | <i>None</i> |
| Prevention of marine pollution Law | <i>None</i> | <i>None</i> |
| Pneumoconiosis Law | <i>None</i> | <i>There is it in the case of an application or an application</i> |

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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]

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