

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Identification of the substance/preparation	Tronox® Titanium Dioxide, All Grades
Use of the substance/preparation	White pigment for applications in coatings, inks, fibers, plastics, paper.
Version No.	05
Synonym(s)	CR-470, CR-800E, CR-813, CR-822, CR-826, CR-828, CR-834, 8120, CR-880, 8300, 8400, 8410, 8670, 8800, 8870, 8140, 41J.
CAS No.	Mixture
Product code	77891, Pigment White #6
SDS Number	B-5017
Manufacturer	
Manufacturer/Supplier	
Company name	Tronox LLC 3301 NW 150th Street Oklahoma City, OK 73134
Country	USA
Email	ChemProdSteward@tronox.com
Telephone	+1-405-775-5000 (24-hours)
Emergency telephone number	+1-760-476-3960 (Access code 333318)

2. HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines.

Physical hazards	Not classified as a physical hazard.
Health hazards	Not classified for health hazards. However, occupational exposure to the mixture or substance(s) may cause adverse health effects.
Environmental hazards	Not classified as an environmental hazard.
Specific hazards	Dusts or powder may irritate the respiratory tract, skin and eyes. Frequent inhalation of fume/dust over a long period of time may increase the risk of developing lung diseases although epidemiological studies among titanium dioxide workers could not demonstrate this.
Main symptoms	Upper respiratory tract irritation. Coughing. Irritation of eyes and mucous membranes. Skin irritation.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS No.	Percent	EC-No.	Classification
Titanium dioxide	13463-67-7	80 - 97	236-675-5	
Silicon dioxide	7631-86-9	0 - 15	231-545-4	
Aluminium hydroxide	21645-51-2	0 - 10	244-492-7	
Zirconium dioxide	1314-23-4	0 - 2	215-227-2	

Composition comments Components listed make up an inseparable chemically reacted pigment. Silicon dioxide is present in finished product as amorphous silica.

4. FIRST-AID MEASURES

Inhalation	Move to fresh air. Get medical attention if any discomfort continues.
Skin contact	Flush skin thoroughly with water. Get medical attention if irritation develops or persists.
Eye contact	Do not rub eyes. Immediately rinse eyes with water. Remove any contact lenses, and continue flushing eyes with running water for at least 15 minutes. Hold eyelids apart to ensure rinsing of the entire surface of the eye and lids with water. Get immediate medical attention.
Ingestion	Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. Never give anything by mouth to an unconscious person. If ingestion of a large amount does occur, call a poison control centre immediately.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.
Notes to physician	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Use fire-extinguishing media appropriate for surrounding materials.
Extinguishing media which must not be used for safety reasons	No restrictions known.
Unusual fire & explosion hazards	This product is not flammable.
Specific hazards	None known.
Special protective equipment for fire-fighters	Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk. Prevent runoff from fire control or dilution from entering streams, sewers or drinking water supply.
General fire hazards	The product is not flammable.

6. ACCIDENTAL RELEASE MEASURES

Containment procedures	Collect and dispose of spillage as indicated in section 13 of the SDS. Prevent entry into waterways, sewer, basements or confined areas.
Personal precautions	Avoid inhalation of dust and contact with skin and eyes. Wear appropriate protective equipment and clothing during clean-up. Local authorities should be advised if significant spillages cannot be contained.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water.
Methods for cleaning up	Avoid dust formation. Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into closed container. For waste disposal, see section 13 of the SDS.

7. HANDLING AND STORAGE

Handling	Avoid inhalation of dust and contact with skin and eyes. Use only with adequate ventilation. Use Personal Protective Equipment recommended in section 8 of the SDS. Wash thoroughly after handling. Observe good industrial hygiene practices.
Storage	Titanium dioxide is a stable chemical compound that does not decompose during storage but can pick up moisture from the environment if not stored properly affecting product performance. Store indoors in a dry place, away from rain and wet floors. Use on a first-in first-out basis from receipt of the shipment.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limits

India. OELs. The Factories Act, The Second Schedule: Permissible Levels of Certain Chemical Substances in the Work Environment

Components	Type	Value	Form
Silicon dioxide (CAS 7631-86-9)	TWA	10 mg/m ³	Total dust.
Zirconium dioxide (CAS 1314-23-4)	STEL	10 mg/m ³	
	TWA	5 mg/m ³	

Recommended monitoring procedures

Additional exposure data	Not available.
Engineering measures	Ventilate as needed to control airborne dust. Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of dust.
Personal protective equipment	
Respiratory protection	In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter. Seek advice from local supervisor.
Hand protection	Wear suitable gloves. Suitable gloves can be recommended by the glove supplier.
Eye protection	Wear dust-resistant safety goggles where there is risk of eye contact.
Skin and body protection	Wear appropriate clothing to prevent repeated or prolonged skin contact.
Environmental exposure controls	Contain spills and prevent releases and observe national regulations on emissions.
Hygiene measures	Do not breathe dust. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.
Control parameters	Follow standard monitoring procedures.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Solid.
Form	Powder.
Colour	White.
Odour	Odourless.
Odour threshold	Not applicable.
pH	Not applicable.
Melting point/freezing point	1830 - 1850 °C (3326 - 3362 °F)
Boiling point, initial boiling point, and boiling range	2500 - 3000 °C (4532 - 5432 °F)
Flash point	Not available.
Auto-ignition temperature	Not available.
Combustion characteristics (solid, gas)	Not applicable.
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapour pressure	Not available.
Vapour density	Not available.
Solubility(ies)	
Solubility (water)	Insoluble in water.
Partition coefficient (n-octanol/water)	Not applicable.
Decomposition temperature	Not available.
Bulk density	600 kg/m ³ Approx. (@ 20°C)
Viscosity	Not applicable.
Other data	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Relative density	4,1 Approx. (@ 20°C)

10. STABILITY AND REACTIVITY

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Conditions to avoid	Avoid dust formation.
Hazardous decomposition products	No hazardous decomposition products are known.
Stability	Material is stable under normal conditions.
Materials to avoid	None known.
Hazardous polymerisation	Hazardous polymerisation does not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological data

Components	Species	Test results
Aluminium hydroxide (CAS 21645-51-2)		
Acute		
<i>Oral</i>		
LD50	Rat	> 5000 mg/kg
Acute toxicity	May cause discomfort if swallowed.	
Routes of exposure	Inhalation. Eye contact. Skin contact.	
Toxicological information	Occupational exposure to the substance or mixture may cause adverse effects.	
Chronic toxicity	Frequent inhalation of dust over a long period of time may increase the risk of developing chronic lung diseases and skin irritation.	
Sensitisation	Not a skin sensitiser.	

Carcinogenicity Suspected of causing cancer. IARC has classified TiO₂ as 2B Possibly carcinogenic to humans. However, the only evidence of carcinogenicity is in rats exposed to very high concentrations. Two major epidemiology studies among titanium dioxide workers in the US and in EUROPE could not demonstrate an elevated lung cancer risk.

Boffetta et. al. Mortality among workers employed in the titanium dioxide production industry in Europe. *Cancer Causes Control*. 2004 Sep;15(7):697-706.

Fryzek et. al. A cohort mortality study among titanium dioxide manufacturing workers in the United States. *J Occup Environ Med*. 2003 Apr;45(4):400-9.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. IARC Monographs, Volume 93 (Summary)

IARC Monographs. Overall Evaluation of Carcinogenicity

Titanium dioxide (CAS 13463-67-7)

2B Possibly carcinogenic to humans.

Mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Teratogenicity None known.

Reproductivity None known.

Epidemiology None known.

Neurotoxicity None known.

Local effects Dusts may irritate the respiratory tract, skin and eyes.

Symptoms and target organs Dusts or powder may irritate the respiratory tract, skin and eyes. Coughing. Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases.

Further information No other specific acute or chronic health impact noted.

12. ECOLOGICAL INFORMATION

Ecotoxicity The product is not expected to be hazardous to the environment.

Environmental effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Persistence and degradability The degradability of the product has not been stated.

Bioaccumulation Bioaccumulation is unlikely to be significant because of the low water solubility of this product.

Aquatic toxicity Not available.

Mobility The product is insoluble in water and will sediment in water systems.

13. DISPOSAL CONSIDERATIONS

Disposal instructions Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. Dispose of this material and its container to hazardous or special waste collection point. Do not allow this material to drain into sewers/water supplies.

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. REGULATORY INFORMATION

Labelling

R-phrases(s) None.

S-phrases(s) None.

Regulatory information This material is not considered to be hazardous according to regulatory guidelines.

16. OTHER INFORMATION

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Europe	European List of Notified Chemical Substances (ELINCS)	No

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

Recommended use	White pigment for applications in coatings, inks, fibers, plastics, paper, glass, vitreous enamels, and ceramics.
Further information	Nanoparticle Statement- The average primary particle size of this product is larger than the nanoparticle size range as described by ISO/TC 229 and should not be considered as manufactured nanoparticles or nanomaterials. As with other particulate materials there will be a distribution of particle sizes around the average and a small portion of these may be covered by the nanoparticle definition. In this product, the primary particle size is in the 200-300 nm range. However, the primary particle size does not represent the size of particles in this product as supplied since these tend to aggregate or agglomerate into larger particles.
Bibliography	HSDB® - Hazardous Substances Data Bank IARC Monographs. Overall Evaluation of Carcinogenicity
Disclaimer	The information in the sheet was written based on the best knowledge and experience currently available.
Prepared by	Tronox LLC
Issue date	30-January-2012
Revision date	13-March-2015
This SDS contains revisions in the following section(s):	This safety data sheet contains revisions in the following section(s): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16