Safety Data Sheet

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

Trade name : TioSTAR R-802

Product name : Titanium dioxide

Supplier's details

Company : Maha Chemicals (Asia) Pte Ltd
Street address : 51 Tuas West Drive, Singapore 638415
Telephone : 65-6863 1808
Telefax : 65-6863 1819

Emergency telephone number : 65-6863 1808

Recommended use of the chemical and restriction on use

Recommended use : Pigments

2. HAZARDS IDENTIFICATION

GHS-Classification

Not a dangerous substance or mixture according to the Globally Harmonised System (GHS).

Other hazards which do not result in classification or are not covered by the GHS

Contact with dust can cause mechanical irritation or drying of the skin. Dust contact with the eyes can lead to mechanical irritation. May cause nose, throat, and lung irritation.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

Components

Chemical Name	CAS-No.	Concentration	ENCS/ISHL number
Titanium dioxide	13463-67-7	90 - 100%	(1)-558
Aluminum hydroxide	21645-51-2	<10%	(1)-17
Silicon dioxide, amorphous	7631-86-9	<10%	(1)-548

4. FIRST AID MEASURES

Inhalation : Remove person to fresh air. If signs/symptoms continue, get medical attention.

Skin contact : Wash off with soap and water.

Eye contact : Rinse with plenty of water.

Ingestion	:	Consult a physician if necessary.
Most important symptoms/effects, acute and delayed	:	irritant effects
Protection of first-aiders	:	not applicable
Notes to physician	:	No specific intervention is indicated. No special protective equipment required.

5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Specific hazards	:	Not a fire or explosion hazard.
Special protective equipment for firefighters	:	No special protective equipment required.
Specific extinguishing methods	:	not applicable
Specific methods	:	The product itself does not burn.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Avoid breathing dust.
Environmental precautions	:	Do not flush into surface water or sanitary sewer system.
Methods and materials for containment and cleaning up	:	Pick up and arrange disposal without creating dust. After cleaning, flush away traces with water.

7. HANDLING AND STORAGE

Handling

Technical measures/Precautions	:	Avoid breathing dust.
Local exhaust ventilation / adequate ventilation	:	No information available.
Precautions for safe handling	:	This is a fully oxidized mineral product. As such it cannot support combustion or participate in a dust explosion.

Hygiene measures : Wash hands before breaks and at the end of workday.

Storage

Suitable storage conditions : Keep container tightly closed in a dry and well-ventilated place.

Suitable container and packaging materials for safe storage : No information available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical Name	Occupational Exposure Limits	Regulation
Titanium dioxide		
TWA	1 mg/m3 (Respirable dust.)	JSOH OELs (05 2009)
TWA	4 mg/m3 (Total dust.)	JSOH OELs (05 2009)
TWA	10 mg/m3	US ACGIH (2011)

Engineering measures : Use sufficient ventilation to keep employee exposure below recommended limits.

Biological Limits : not applicable

Personal protective equipment

Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection : Gloves

Eye protection : Safety glasses with side-shields

Skin and body protection : No personal body protection normally required.

Protective measures : No other specific measures identified.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (Physical state, form, colour, etc.)
Physical state : solid
Form : crystalline
Colour : white

Odour : odourless

Odour Threshold : not applicable

pH : not applicable

Melting point/freezing point
Melting point : 1,843 °C

Boiling point, initial boiling point and boiling range
Boiling point : 3,000 °C

Flash point : does not flash

Evaporation rate : not applicable

Flammability (solid, gas): The product is not flammable.

Upper/lower flammability or explosive limits
Upper explosion limit : not applicable
Lower explosion limit : not applicable

Vapour pressure : not applicable

Vapour density : not applicable

Density
Specific gravity (Relative density) : 3.4 - 4.3

Solubility(ies)
Water solubility : insoluble
Solubility in other solvents : not applicable

Partition coefficient: n-octanol/water : not applicable

Auto-ignition temperature
Auto-ignition temperature : not applicable
Self ignition : not applicable

Decomposition temperature : not applicable

Viscosity (coefficient of viscosity)
Viscosity, kinematic : not applicable

Viscosity, dynamic : not applicable

Molecular weight : not applicable

10. STABILITY AND REACTIVITY

Reactivity : None reasonably foreseeable.

Chemical stability : Stable

Possibility of hazardous reactions : None.

Conditions to avoid : None known.

Materials to avoid : None.

Hazardous decomposition products : not applicable

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral

: LD50/rat: > 5,000 mg/kg

Inhalation

: LC50/4 h/rat(dust/mist): > 6.82 mg/l
The substance or mixture has no acute inhalation toxicity

Skin corrosion/irritation

: Species: rabbit
Result: No skin irritation
Classification: Not classified as irritant
Contact with dust can cause mechanical irritation or drying of the skin.

Serious eye damage/eye irritation

: Species: rabbit
Result: No eye irritation
Classification: Not classified as irritant
Dust contact with the eyes can lead to mechanical irritation.

Respiratory or skin sensitisation

: Local lymph node test
Species: mouse
Result: Did not cause sensitisation on laboratory animals.

Buehler Test
Species: guinea pig
Result: Did not cause sensitisation on laboratory animals.

Germ cell mutagenicity

: Did not cause genetic damage in animals. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Carcinogenicity

: In lifetime inhalation studies rats were exposed for 2 years to respectively 10, 50 and 250 mg/m3 of respirable TiO2. Slight lung fibrosis was observed at 50 and 250 mg/m3 levels. Microscopic lung tumours were also observed in 13 percent of the rats exposed to 250 mg/m3, an exposure level that caused lung overloading and impairment of rat lungs clearance mechanisms.
In further studies, these tumours were found to occur only under particle overload conditions in a uniquely sensitive species, the rat, and have little or no relevance for humans. The pulmonary inflammatory response to TiO2 particles exposure was also found to be much more severe in rats than in other rodent species.
In February 2006, IARC has re-evaluated Titanium dioxide as pertaining to Group 2B: "possibly carcinogenic to humans", based upon inadequate evidence in humans and sufficient evidence in experimental animals for the carcinogenicity of titanium dioxide. IARC evaluation guidelines consider the generation of tumours, in 2 different studies within the same animal species, to be adequate criteria for an assessment of sufficient evidence.
The conclusions of several epidemiology studies on more than 20000 TiO2 industry workers in Europe and the USA did not suggest a carcinogenic effect of TiO2 dust on the human lung. Mortality from other chronic diseases, including other respiratory diseases, was also not associated with exposure to TiO2 dust.
Based upon all available study results, the scientist conclude that titanium dioxide will not cause lung cancer or chronic respiratory diseases in humans at concentrations experienced in the workplace.

Reproductive toxicity

: Reproductive toxicity: Block component info.
Teratogenicity: Block component info.

Specific Target Organ Toxicity

Specific target organ toxicity - single exposure

: Refer to acute toxicity and/or repeated dose toxicity data for more information on target organs if applicable.

Aspiration hazard

: not applicable

Other

: Repeated dose toxicity:
Oral/rat
No toxicologically significant effects were found.
Inhalation/rat
No toxicologically significant effects were found.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects : LC50/96 h/Pimephales promelas (fathead minnow): > 1,000 mg/l

Toxicity to aquatic plants

: EC50/72 h/Pseudokirchneriella subcapitata (green algae): 61 mg/l

Acute toxicity to aquatic invertebrates

: EC50/48 h/Daphnia magna (Water flea): > 1,000 mg/l

Persistence and degradability

: Pigments are practically not biodegradable.

Bioaccumulation

: Does not bioaccumulate.

Mobility in soil

No information available.

Other adverse effects

: not applicable

13. DISPOSAL CONSIDERATIONS

Disposal regulatory information : Dispose in accordance with the Waste Disposal and Public Cleaning Law (Enforcement Ordinance, Section 6). When consigning for disposal, do so after signing a contract with a (specially controlled) industrial waste disposer approved by the local authority.

Waste disposal methods : Dispose of in accordance with local regulations.

Contaminated packaging : When disposing of empty containers, completely remove the content, and dispose of it in accordance with the Waste Disposal and Public Cleaning Law (Enforcement Ordinance, Section 6) in the same manner as with residual wastes.

14. TRANSPORT INFORMATION

International transport regulations	:	Not classified as dangerous in the meaning of transport regulations.
UN DG classification	:	not applicable
UN number	:	not applicable
Domestic transport regulations	:	not applicable
Additional regulations	:	not applicable
Matters needing attention for transportation	:	not applicable
Emergency Response Guidebook Number	:	not applicable

15. REGULATORY INFORMATION

ISHL	Substances Subject to be Notified Names: Titanium dioxide(191), Silicon dioxide, amorphous(312)
Prevention of Hazards due to Dust	Applied to work in a place where titanium dioxide is bagged.

16. OTHER INFORMATION

SDS Prepared by:

Maha Chemicals (Asia) Pte Ltd
Prepared on: 26 July 2015

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