SAFETY DATA SHEET

Trimethylolpropane flake
10690

Version / Revision	3	**Revision Date**	06-May-2020
Supersedes Version	2.02	**Issuing date**	19-May-2020

SECTION 1: Identification

1.1. Product identifier

Identification of the substance/preparation **Trimethylolpropane flake**

CAS-No 77-99-6

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance / Preparation Intermediate
Polymerization
Uses advised against None

1.3. Details of the supplier of the safety data sheet

Supplier

OQ Chemicals Corporation
15375 Memorial Drive
West Memorial Place I
Suite 300
Houston, TX 77079
USA
Phone +1 346 378 7300

Product Information

Product Stewardship
FAX: +49 (0)208 693 2053
email: sc.psq@oq.com

1.4. Emergency telephone number

Emergency telephone number NCEC +1 202 464 2554
available 24/7

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

This substance is classified in accordance with paragraph (d) of §1910.1200 (GHS-US classification).

Reproductive toxicity Category 2, H361

OSHA Specified Hazards .
Combustible dust

2.2. Label elements

Labeling according to §1910.1200 (GHS-US labeling).

Hazard symbol(s)

Signal word	**Warning**
Hazard statements	May form combustible dust concentrations in air. H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Precautionary statements	
Prevention	P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P280: Wear protective gloves/protective clothing/eye protection/face protection.
Response	P308 + P313: IF exposed or concerned: Get medical advice/ attention.
Storage	P405: Store locked up.
Disposal	P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards

None known

SECTION 3: Composition / information on ingredients

3.1. Substances

Component	CAS-No	Concentration (%)
Trimethylolpropane (TMP)	77-99-6	> 98,0

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
Keep at rest. Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Skin
Wash off immediately with plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

Eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.

Ingestion
Call a physician immediately. Do not induce vomiting without medical advice.

4.2. Most important symptoms and effects, both acute and delayed

Main symptoms
cough.

Special hazard
Lung irritation.

4.3. Indication of any immediate medical attention and special treatment needed

General advice
Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself.

Treat symptomatically. If ingested, irrigate the stomach using activated charcoal.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
foam, dry chemical, carbon dioxide (CO2), water spray

Unsuitable Extinguishing Media
Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Under conditions giving incomplete combustion, hazardous gases produced may consist of:
carbon monoxide (CO)
carbon dioxide (CO2)
Combustion gases of organic materials must in principle be graded as inhalation poisons
Dust can form an explosive mixture in air

5.3. Advice for firefighters

Special protective equipment for firefighters
Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

Precautions for firefighting
Cool containers / tanks with water spray. Dike and collect water used to fight fire. Keep people away from and upwind of fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: For personal protective equipment see section 8. Avoid contact with skin and eyes. Do not breathe dust. Keep people away from and upwind of spill/leak. Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.
For emergency responders: Personal protection see section 8.

6.2. Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant).

6.3. Methods and material for containment and cleaning up

Methods for containment
Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.

Methods for cleaning up
Use mechanical handling equipment. Keep in suitable, closed containers for disposal. Dispose of in accordance with local regulations. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4. Reference to other sections

For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling
Avoid dust formation. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms. Handle product only in closed system or provide appropriate exhaust ventilation at machinery.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Advice on the protection of the environment
See Section 8: Environmental exposure controls.

Incompatible products

strong oxidizing agents

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion
Risk of dust explosion in fine crystalline powder form. Dust can form an explosive mixture in air. Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material.

Technical measures/Storage conditions
Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care. Protect from moisture.

Unsuitable material
None known

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits United States of America

US ACGIH

Component	TWA (mg/m³)	TWA (ppm)	STEL (mg/m³)	STEL (ppm)
Dust, general threshold limit value (respirable fraction) CAS: -	3			
Dust, general threshold limit value (inhalable fraction) CAS: -	10			

US OSHA Z-1

Component	Ceiling (mg/m³)	Ceiling (ppm)	PEL (mg/m³)	PEL (ppm)	Skin Designation
Dust, general threshold limit value (respirable fraction) CAS: -			5		
Dust, general threshold limit value (inhalable fraction) CAS: -			15		

Note
For details and further information please refer to the original regulation.

8.2. Exposure controls

Appropriate Engineering controls
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Individual protection measures, such as personal protective equipment

General industrial hygiene practice
Avoid contact with skin, eyes and clothing. Do not breathe dust or mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Eye protection
Tightly fitting safety goggles.

Hand protection
Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Suitable material	nitrile rubber
Evaluation	according to EN 374: level 6
Glove thickness	approx 0,55 mm
Break through time	> 480 min

Suitable material	polyvinylchloride / nitrile rubber
Evaluation	according to EN 374: level 6
Glove thickness	approx 0,9 mm
Break through time	> 480 min

Skin and body protection
Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Respiratory protection
Respirator with a particle filter (P1). Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in case of product release (dust). Equipment should conform to NIOSH.

Environmental exposure controls
Use product only in closed system. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Flakes wax like
Colour	white
Odour	odourless
Odour threshold	No data available
pH	5,6 @ 25 °C (77 °F)
Melting point/range	136 °F (58 °C)
Boiling point/range	579 °F (304 °C) @ 1 atm (101,3 kPa)
Flash point	300 - 356 °F (149 - 180 °C)
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Lower explosion limit	2 Vol %
Upper explosion limit	11,8 Vol %

Vapour pressure

Values [hPa]	Values [kPa]	Values [atm]	@ °C	@ °F	Method
< 0,001	< 0,0001	< 0,0001	20	68	

Vapour density	4,63 (Air = 1) @ 20 °C (68 °F)

Relative density

Values	@ °C	@ °F	Method
1,084 - 1,09	20	68	

Solubility	100 - 1000 g/l @ 68 °F (20 °C), in water
log Pow	-0,47 (measured)
Autoignition temperature	~ 707 °F (~ 375 °C)
Method	DIN 51794
Decomposition temperature	No data available
Viscosity	No data available

9.2. Other information

Molecular weight	134,17
Molecular formula	C6 H14 O3
Oxidizing properties	Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties
Explosive properties	Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties

SECTION 10: Stability and Reactivity

10.1. Reactivity

The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Dust can form an explosive mixture in air.

10.4. Conditions to avoid

Avoid contact with heat, sparks, open flame and static discharge. Avoid any source of ignition.

10.5. Incompatible materials

strong oxidizing agents.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure Ingestion, Inhalation, Eye contact, Skin contact

Trimethylolpropane (TMP), CAS: 77-99-6
Main symptoms
cough.
Target Organ Systemic Toxicant - Single exposure
Based on available data, the classification criteria are not met for:
STOT SE
Target Organ Systemic Toxicant - Repeated exposure
Based on available data, the classification criteria are not met for:
STOT RE

Acute toxicity				
Trimethylolpropane (TMP) (77-99-6)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	~ 14700 mg/kg	rat, male	OECD 401
Dermal	LD50	> 10000 mg/kg	rabbit	OECD 402
Inhalative	LC50	> 0,85 mg/l (4h)	rat, male	

Trimethylolpropane (TMP), CAS: 77-99-6
Assessment
Based on available data, the classification criteria are not met for:
Acute oral toxicity
Acute dermal toxicity
Acute inhalation toxicity
STOT SE

Irritation and corrosion				
Trimethylolpropane (TMP) (77-99-6)				
Target Organ Effects	Species	Result	Method	

Skin	rabbit	No skin irritation		
Eyes	rabbit	No eye irritation		

Trimethylolpropane (TMP), CAS: 77-99-6
Assessment
Based on available data, the classification criteria are not met for:
skin irritation/corrosion
eye irritation/corrosion
For respiratory irritation, no data are available

Sensitization				
Trimethylolpropane (TMP) (77-99-6)				
Target Organ Effects	Species	Evaluation	Method	
Skin	mouse	not sensitizing	OECD 429	

Trimethylolpropane (TMP), CAS: 77-99-6
Assessment
Based on available data, the classification criteria are not met for:
Skin sensitization
For respiratory sensitization, no data are available

Subacute, subchronic and prolonged toxicity				
Trimethylolpropane (TMP) (77-99-6)				
Type	Dose	Species	Method	
Subchronic toxicity	NOAEL: ~ 67 mg/kg/d (90d)	rat, male/female		Oral

Trimethylolpropane (TMP), CAS: 77-99-6
Assessment
Based on available data, the classification criteria are not met for:
STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity					
Trimethylolpropane (TMP) (77-99-6)					
Type	Dose	Species	Evaluation	Method	
Mutagenicity		Salmonella typhimurium	negative	OECD 471 (Ames)	In vitro study
Mutagenicity		CHL	negative	OECD 473 (Chromosomal Aberration)	In vitro study
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 476 (Mammalian Gene Mutation)	In vitro study
Reproductive toxicity	NOAEL 800 mg/kg/d	rat, parental		OECD 422, Oral	in vivo
Reproductive toxicity	NOAEL 800 mg/kg/d	rat, 1. Generation, male/female		OECD 422, Oral	in vivo
Reproductive toxicity	NOAEL: 740 ppm	rat rat, parental		OECD 443 Oral	in vivo

Reproductive toxicity	NOAEL: 2200 ppm	rat, 1. Generation, male/female		OECD 443 Oral	in vivo
Developmental Toxicity	NOAEL 100 mg/kg/d	rat		OECD 414, Oral	in vivo
Developmental Toxicity	NOAEL 100 mg/kg/d	rabbit		OECD 414, Oral	in vivo

Trimethylolpropane (TMP), CAS: 77-99-6
CMR Classification
The available data on CMR properties are summarized in the table above. They do not indicate a classification into categories 1A or 1B
The substance has been classified as:
Repr. 2
Evaluation
In vitro tests did not show mutagenic effects
In the absence of specific alerts no cancer testing is required
Suspected of damaging fertility or the unborn child

Trimethylolpropane (TMP), CAS: 77-99-6
Aspiration toxicity
no data available
Note
Handle in accordance with good industrial hygiene and safety practice. Further details on substance data can be found in the registration dossier under the following link:
http://echa.europa.eu/information-on-chemicals/registered-substances.

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity			
Trimethylolpropane (TMP) (77-99-6)			
Species	Exposure time	Dose	Method
Daphnia magna (Water flea)	48h	EC50: 13000 mg/l	
Alburnus alburnus	96h	LC50: > 1000 mg/l	DEV L8
Pseudokirchneriella subcapitata	72h	EC50: > 1000 mg/l	
Activated sludge (domestic)	3 h	EC50: > 1000 mg/l	DIN 38412, part 11

Long term toxicity				
Trimethylolpropane (TMP) (77-99-6)				
Type	Species	Dose	Method	
Mortality	Daphnia magna (Water flea)	NOEC: > 1000 mg/l (21d)		

12.2. Persistence and degradability

Trimethylolpropane (TMP), CAS: 77-99-6
Biodegradation

6 % (28 d), activated sludge, industrial, non-adapted, OECD 301 E, Not readily biodegradable,
100 % (28 d), activated sludge, OECD 302 B (Zahn-Wellens Test), Inherently biodegradable.

Abiotic Degradation		
Trimethylolpropane (TMP) (77-99-6)		
Type	Result	Method
Hydrolysis	Half-life (DT50): > 356 d @ 25°C	OECD 111
Photolysis	Half-life (DT50): 1,2 days	calculated

12.3. Bioaccumulative potential

Trimethylolpropane (TMP) (77-99-6)		
Type	Result	Method
log Pow	-0,47	measured
log BCF	< 2	calculated, OECD 305 C

12.4. Mobility in soil

Trimethylolpropane (TMP) (77-99-6)		
Type	Result	Method
Surface tension	71 mN/m @ 20 °C (68 °F)	measured
Adsorption/Desorption	Koc: 1,5	calculated
Distribution to environmental compartments	Air: 0,32 Soil: 59,7 Water: 39,9 Sediment: 0,07	Calculation according Mackay, Level III

12.5. Results of PBT and vPvB assessment

Trimethylolpropane (TMP), CAS: 77-99-6
PBT and vPvB assessment
This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Other adverse effects

Trimethylolpropane (TMP), CAS: 77-99-6
No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product Information
Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local

statutes and possibilities for disposal.

Uncleaned empty packaging
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

SECTION 14: Transport information

Section 14.1 - 14.6

D.O.T. (49CFR) Not restricted

ICAO-TI / IATA-DGR Not restricted

IMDG Not restricted

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code not applicable

SECTION 15: Regulatory information

Federal and State Regulations
Components of the product are listed in the quoted regulations. For details please refer to the regulations directly. This list is not exhaustive, please check for other applicable regulations.

Federal Regulations
This product is listed on the TSCA inventory

Trimethylolpropane (TMP), CAS: 77-99-6
40CFR 63.100-.106, Table 1: Group I

International Inventories

Trimethylolpropane (TMP), CAS: 77-99-6
AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2010749 (EU)
ENCS (2)-245 (JP)
ISHL (2)-245 (JP)

KECI KE-13838 (KR)
INSQ (MX)
PICCS (PH)
TSCA (US)
NZIoC-NZ May be used as single component chemical
TCSI (TW)

SECTION 16: Other information

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Hazard Rating Systems

NFPA (National Fire Protection Association)

Health Hazard	1
Fire Hazard	1
Reactivity	0

HMIS (Hazardous Material Information System)

Health Hazard	1
Flammability	1
Physical Hazard	0

Training advice
For effective first-aid, special training / education is needed.

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on OQ owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet
Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the OQ homepage (www.chemicals.oq.com).
The use of a comma in section 3 and section 7 to 12 is the same as a period.

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End of Safety Data Sheet