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

1.1. Identification of the product

Substance name:
REACH Registration Name: 4-Methylpent-3-en-2-one
REACH Registration Number: 01-2119493103-44-0000
EC Nr: 205-502-5
CAS-No.: 141-79-7

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

Use of the Substance/Mixture : Chemical intermediate, The substance must be handled under strictly controlled conditions as defined in Article 18(4) of Regulation (EC) No. 1907/2006.

1.3. Details of the supplier of the safety data sheet

Supplier

Transchem, Inc
2141 Palomar Airport Rd
Ste 125
Carlsbad CA 92011
PH: 760.431.6310
Fax: 760.431.6312

1.4. Emergency telephone number

CHEMTEL:(800) 255-3924

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008):
Flammable liquids, 3, H226
Oral: Acute toxicity, 4, H302
Dermal: Acute toxicity, 4, H312
Inhalation: Acute toxicity, 3, H331
Skin irritation, 2, H315
Eye irritation, 2, H319
Inhalation: Specific target organ toxicity - single exposure, 3, H335

Additional information:
For the full text of the H, EUH-phrases mentioned in this Section, see Section 16.

2.2. Label elements

Label elements (REGULATION (EC) No 1272/2008):

Hazardous components which must be listed on the label:
No. in ANNEXE : 606-009-00-1 4-methylpent-3-en-2-one; mesityl oxide

Hazard pictograms:

Signal word: **Danger**

Hazard statements:
H226 : Flammable liquid and vapour.
H302 : Harmful if swallowed.
H312 : Harmful in contact with skin.
H331 : Toxic if inhaled.
H315 : Causes skin irritation.
H319 : Causes serious eye irritation.
H335 : May cause respiratory irritation.

Precautionary statements:
Prevention:
P210 : Keep away from open flames/hot surfaces. - No smoking.
P261 : Avoid breathing gas, mist, vapours, spray.
P280 : Wear protective gloves/protective clothing/eye protection/face protection.
Response:
P303 + P361 + P353 : IF ON SKIN (or hair): Remove or take off immediately all contaminated clothing. Rinse skin with water and shower.
P311 : Call a POISON CENTER /doctor.
Storage:
P403 + P233 : Store in a well-ventilated place. Keep container tightly closed.

2.3. Other hazards

Potential health effects:
Toxic by inhalation.
Skin contact: Slightly irritating to skin.
Eye contact: Irritating to eyes.
Ingestion: Harmful if swallowed.

Environmental Effects:
Slightly bioaccumulable. Readily biodegradable. Harmful to fish. Harmful to daphnia. Slightly harmful to algae

Physical and chemical hazards:
Flammable liquid
Thermal decomposition giving flammable and toxic products.
Decomposition products: See chapter 10

Other:
Results of PBT and vPvB assessment : According to REACH regulation, annex XIII, the substance does not meet PBT and vPvB criteria.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Chemical name[1]	EC-No.	CAS-No.	Concentration	Classification REGULATION (EC) No 1272/2008
4-methylpent-3-en-2-one (N° ANNEX: 606-009-00-1)	205-502-5	141-79-7	>= 89 %	Flam. Liq.3; H226 Acute Tox.4 (Oral); H302 Acute Tox.3 (Inhalation); H331 Acute Tox.4 (Dermal); H312 Skin Irrit.2; H315 Eye Irrit.2; H319
4-Methyl-4-penten-2-one	–	3744-02-3	< 11 %	Flam. Liq.3; H226 Acute Tox.3 (Inhalation); H331 Acute Tox.4 (Dermal); H312 Acute Tox.4 (Oral); H302 Eye Irrit.2; H319 Skin Irrit.2; H315 STOT SE3 (Inhalation); H335

[1]: See chapter 14 for Proper Shipping Name

4. FIRST AID MEASURES

4.1. Description of necessary first-aid measures:

General advice:
Under the shower: Take off immediately all contaminated clothing (including shoes).

Inhalation:
Move patient from contaminated area to fresh air. Oxygen or artificial respiration if needed. Keep under medical surveillance. In case of problems : Hospitalise.

Skin contact:
Wash immediately, abundantly and thoroughly with water. Consult a physician. In case of extensive burns, hospitalize.

Eye contact:
Wash open eyes immediately, abundantly and thoroughly for at least 15 minutes. Consult an ophthalmologist immediately.

Ingestion:
Do not induce vomiting, rinse mouth and lips with plenty of water if the subject is conscious, then hospitalize.

Protection of first-aiders:
If entering a saturated atmosphere, wear a self contained breathing apparatus. Protective suit.

4.2. Most important symptoms/effects, acute and delayed: No data available.

4.3. Indication of immediate medical attention and special treatment needed, if necessary: No data available.

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media: Water spray, Foam, Dry powder, Carbon dioxide (CO2)

Unsuitable extinguishing media: High volume water jet

5.2. Special hazards arising from the substance or mixture:
Flammable.
Possible re-ignition of vapours from a distance
Warm impregnated insulating material can, with time, ignite spontaneously
Thermal decomposition gives :, Peroxides

5.3. Advice for firefighters:

Specific methods:
Use water spray to cool unopened containers. Ensure containers can be rapidly moved. In case of fire nearby, remove exposed containers.

Special protective actions for fire-fighters:
In the event of fire, wear self-contained breathing apparatus. Complete suit protecting against chemicals.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:
Ensure adequate ventilation. Evacuate personnel to safe areas. Prohibit all sources of sparks and ignition - Do not smoke. Use personal protective equipment. Avoid contact with skin and eyes and inhalation of vapours.

6.2. Environmental precautions:
Prevent product from entering drains. Dam up with sand or inert earth (do not use combustible materials). Should not be released into the environment.

6.3. Methods and materials for containment and cleaning up:

Recovery:
Pump into a labelled inert emergency tank. Moist product : absorb the remainder with an inert absorbent material. Capture the gas with fine water spray (scrubbing), collect and treat contaminated water.

Elimination:
Destroy the product by incineration (in accordance with local and national regulations).

6.4. Reference to other sections: None.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling:

Technical measures/Precautions:
Storage and handling precautions applicable to products: Liquid. Flammable. Toxic. Provide appropriate exhaust ventilation at machinery. Provide showers, eye-baths. Provide water supplies near the point of use. Provide fire-blanket nearby. Provide waterproof electrical equipment. Provide self-contained breathing apparatus nearby. Well ventilate empty vats and tanks before entering.

Safe handling advice:

Prohibit all sources of sparks and ignition - Do not smoke. Use only in an area containing explosion proof equipment.This substance should be handled under strictly controlled conditions as specified in REACH regulation article 18(4). Site documentation to support safe handling arrangements in accordance with risk-based management system should be available at each manufacturing site. During the whole lifecycle all necessary measures should be undertaken to minimize emissions and any resulting exposure.

Hygiene measures:
Avoid inhalation of vapours. Do not get in eyes, on skin, or on clothing. When using do not eat, drink or smoke.
Wash hands after handling. Remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including any incompatibilities:
Keep tightly closed in a dry, cool and well-ventilated place. Store protected from moisture and heat. Remove all sources of ignition. Provide a catch-tank in a bunded area. Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres.

Incompatible products:
Strong oxidizing agents Amines

Packaging material:
Recommended: Ordinary steel, Stainless steel, Protected glass (for small quantities)

7.3. Specific end use(s):
This substance must be handled under strictly controlled conditions in accordance with REACH regulation Article 18(4) for transported isolated intermediates. Written confirmation of application of strictly controlled conditions has been received from every Downstream User of the intermediate registered by Arkema.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Exposure Limit Values

4-methylpent-3-en-2-one

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
ACGIH (US)	02 2012	TWA	15	–	–
ACGIH (US)	02 2012	STEL	25	–	–

Derived No Effect Level (DNEL):

End Use	Inhalation	Ingestion	Skin contact
Workers	20,4 mg/m3 (LT, SE, LE) 40,8 mg/m3 (ST, SE, LE)		
Consumers	2,4 mg/m3 (LT, SE, LE)		

LE : Local effects, **SE** : Systemic effects, **LT** : Long term, **ST** : Short term

Predicted No Effect Concentration:

Compartment:	Value:
Fresh water	0,0729 mg/l
Marine water	0,00729 mg/l
Water (Intermittent release)	0,729 mg/l
Effects on waste water treatment plants	11,6 mg/l
Fresh water sediment	0,34 mg/kg dw
Marine sediment	0,034 mg/kg dw
Soil	0,12 mg/kg dw

8.2. Exposure controls:
General protective measures: Provide sufficient air exchange and/or exhaust in work rooms.

Personal protective equipment:
Respiratory protection: Low concentrations or short activity: Mask with specific cartridge Recommended Filter type: A2B2E2K2P3
High concentrations or prolonged activity: Self contained Breathing Apparatus
Hand protection: Gloves (PVC, neoprene)
According to permeation index EN 374: 1 (time elapsed > 10 mins)
Eye/face protection: Safety glasses
Skin and body protection: At the workplace : Protective clothing (cotton)
Intervention at incident: Waterproof suit

Environmental exposure controls:

See chapter 6

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance:	
Colour:	colourless
Odour:	characteristic
Olfactory threshold:	12 ppm
pH:	No data available.
Melting point/range :	-53 °C
Boiling point/boiling range :	135 °C (OECD Test Guideline 103)
Flash point:	closed cup: 25 °C (Standard ISO 3507)
Evaporation rate:	No data available.
Flammability (solid, gas):	
Lower flammable limit :	1,5 %(V)
Upper flammable limit :	10,1 %(V)
Vapour pressure:	19,31 hPa , at 25 °C (OECD Test Guideline 104)
Vapour density:	4,07 kg/m3 , at 20 °C
Density:	859,2 kg/m3 , at 15 °C
Relative density (Water=1):	0,859 at 15 °C
Water solubility:	26,98 g/l Highly soluble at 20 °C (OECD Test Guideline 105)
Partition coefficient: n-octanol/water:	log Kow : 1,37 (calculated)
Auto-ignition temperature:	335 °C (Standard A15 (D. 92/69/EEC))
Decomposition temperature:	No data available.
Viscosity, kinematic:	0,717 mm2/s , at 20,15 °C (OECD Test Guideline 114)
Explosive properties:	
Explosivity:	Not relevant (due to its chemical structure)
Oxidizing properties:	Not relevant (due to its chemical structure)

9.2. Other data:

Solubility in other solvents:	Soluble in: , Ethanol Toluene
Surface tension:	68,5 mN/m at 20 °C (OECD Test Guideline 115)
Molecular weight:	98,14 g/mol

10. STABILITY AND REACTIVITY

10.1. Reactivity: No data available.

10.2. Chemical stability:
The product is stable under normal handling and storage conditions.

10.3. Possibility of hazardous reactions:
Under the action of oxygen in air and light : Risk of : Explosive reaction

10.4. Conditions to avoid:
Keep away from heat and sources of ignition. Protect from light.

10.5. Incompatible materials to avoid:
- Very exothermic reaction and possibility of spitting with :, Strong oxidizing agents, Amines
- Violent reaction and flammability with :, Peroxides, Alkaline hydroxides

10.6. Hazardous decomposition products:
Thermal decomposition gives :, Peroxides

11. TOXICOLOGICAL INFORMATION

All available data on this product and/or the components quoted in section 3 and/or the analogue substances/metabolites have been taken into account for the hazard assessment.

11.1. Information on toxicological effects:

Acute toxicity:

Inhalation: **Toxic if inhaled.**
• In animals : LC50/4 h/Rat: 4,5 mg/l (1130 ppm) (Method: , vapour) (vapour)

Ingestion: **Harmful if swallowed.**
• In animals : LD50/Rat: 300 - 2.000 mg/kg (Method: OECD Test Guideline 423)

Dermal: **Slightly harmful in contact with skin**
• In animals : LD50/Rabbit: 5.150 mg/kg

Local effects (Corrosion / Irritation / Serious eye damage):

Skin contact: **Causes mild skin irritation.**
• In animals : Skin irritation (OECD Test Guideline 404, Rabbit, Exposure time: 4 h)

Eye contact: **According to its structure, must be considered as : Causes eye irritation.**

Respiratory or skin sensitisation:

Inhalation: No data available.

Skin contact: **Not a skin sensitizer**
• In animals : No skin allergy was observed. (Method: OECD Test Guideline 406 Guinea pig maximization test)
• In animals : Not a skin sensitizer (Method: Guinea pig maximization test)

CMR effects :

Mutagenicity: **According to available experimental data: Not genotoxic**

In vitro

Inactive in genotoxic in vitro tests
In vitro gene mutation study in bacteria: (Method: OECD Test Guideline 471)
In vitro gene mutations test on mammalian cells: (Method: OECD Test Guideline 476)

In vivo

Micronucleus test in vivo mouse: Inactive (Method: OECD Test Guideline 474)

Carcinogenicity: No data available.

Reproductive toxicity:

Fertility: **Based on the available data, the substance is not suspected of having reprotoxic potential.**
• In animals : Reproductive/Developmental Effects Screening Assay: At high dose :, Effects on fertility
NOAEL (Parental toxicity): 0,41 mg/l
(Method: OECD Test Guideline 422, Rat, Inhalation)

Specific target organ toxicity :

Single exposure : **The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.**
Exposure routes : Inhalation
Target Organs : respiratory tract

Inhalation:

Olfactory threshold: 12 ppm
• In man : Irritating to eyes and respiratory system (>= 25 ppm, >= 0,1 mg/l)
• In animals : Irritating to respiratory system.
Decrease of respiratory frequency by 50 % (61 ppm, 0,25 mg/l)

Repeated exposure: **The substance or mixture is not classified as specific target organ toxicant, repeated exposure.**

• In animals : By inhalation: Local irritation
Target organs: Nasal epithelium, LOAEL= 0,12 mg/l (31ppm) (Method: OECD Test Guideline 422, Rat, 6 s)

Aspiration hazard:

Not applicable

12. ECOLOGICAL INFORMATION

Ecotoxicology Assessment: All available and relevant data on this product and/or the components quoted in section 3 and/or the analogue substances/metabolites have been taken into account for the hazard assessment.

Acute aquatic toxicity : Harmful to aquatic life.

12.1. Acute toxicity :

Fish: **Harmful to fish.**
LC50, 96 h (Danio rerio (zebra fish)) : = 73 mg/l (Method: OECD Test Guideline 203)

Aquatic invertebrates: **Harmful to daphnia.**
EC50, 48 h (Daphnia magna (Water flea)) : = 89,1 mg/l (Method: OECD Test Guideline 202)

Aquatic plants: **Slightly harmful to algae**
ErC50, 72 h (Pseudokirchneriella subcapitata (green algae)) : > 100 mg/l (Method: OECD Test Guideline 201)

Microorganisms:
EC10, 3 h (Activated sludge) : = 115,5 mg/l (Method: OECD Test Guideline 209, Respiration inhibition)

Aquatic toxicity / Long term toxicity:

Aquatic plants: ErC10, 72 h (Pseudokirchneriella subcapitata (green algae)) : 61,6 mg/l (Method: OECD Test Guideline 201)

12.2. Persistence and degradability :

Stability in water:
Half-life: > 1 y at 25 °C and pH 4 - 9
Method: OECD Test Guideline 111

Biodegradation (In water): **Readily biodegradable.**
Readily biodegradable: 75 % after 28 d (Method: OECD Test Guideline 301 F)

12.3. Bioaccumulative potential :

Bioaccumulation: **Low potential to bioaccumulate**
Partition coefficient: n-octanol/water: log Kow : 1,37 (Method: calculated)

12.4. Mobility in soil - Distribution among environmental compartments:

Vapor pressure: 19,31 hPa, 25 °C, (Method: OECD Test Guideline 104)
Surface tension: 68,5 mN/m 20 °C (Method: OECD Test Guideline 115)

Absorption / desorption: log Koc: 1,1 - 1,88 (Method: calculated)

12.5. Results of PBT and vPvB assessment :

According to REACH regulation, annex XIII, the substance does not meet PBT and vPvB criteria.

12.6. Other adverse effects: None known.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment:

Disposal of product: Destroy the product by incineration (in accordance with local and national regulations).

Disposal of packaging: Destroy packaging by incineration at an approved waste disposal site. Clean container with water. Recover waste water for processing later.

14. TRANSPORT INFORMATION

Regulation	14.1. UN number	14.2.UN proper shipping name	14.3.Class*	Label	14.4. PG*	14.5.Environmental hazards	14.6. Special precautions for user
ADR	1229	MESITYL OXIDE	3	3	III	no	
ADN	1229	MESITYL OXIDE	3	3	III	no	
RID	1229	MESITYL OXIDE	3	3	III	no	
IATA Cargo	1229	Mesityl oxide	3	3	III	no	
IATA Passenger	1229	Mesityl oxide	3	3	III	no	
IMDG	1229	MESITYL OXIDE	3	3	III	no	EmS Number: F-E, S-D

*Description: 14.3. Transport hazard class(es)
14.4. Packing group

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

15. REGULATORY INFORMATION

Safety data sheets: accordance with Annex II of Regulation (EC) No 1907/2006 and its amendment(s)

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture:

15.2. Chemical safety assessment:
As defined in Article 18(4) of Regulation (EC) No. 1907/2006 (REACH Regulation), this substance is registered as an isolated intermediate. Therefore, a chemical safety report is not required.

INVENTORIES:

EINECS:	Conforms to
TSCA:	Conforms to
DSL:	All components of this product are on the Canadian DSL
IECSC (CN):	Conforms to
ENCS (JP):	Conforms to
ISHL (JP):	Conforms to
KECI (KR):	Conforms to
PICCS (PH):	Conforms to
AICS:	Conforms to
NZIOC:	Conforms to

16. OTHER INFORMATION

Full text of H, EUH-phrases referred to under sections 2 and 3

H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.

Thesaurus:
NOAEL : No Observed Adverse Effect Level (NOAEL)
LOAEL : Lowest Observed Adverse Effect Level (LOAEL)
bw : Body weight
food : oral feed
dw : Dry weight
vPvB : very Persistent and very Bioaccumulative
PBT : Persistent, Bioaccumulative and Toxic

This information applies to the PRODUCT AS SUCH and conforming to specifications of ARKEMA. In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear. The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security purposes. The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive. It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product. It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product (usage, storage, cleaning of containers, other processes) the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment.

NB: In this document the numerical separator of the thousands is the "." (point), the decimal separator is "," (comma).