GPS Safety Summary

Substance Name:

4-methylpent-3-en-2-one

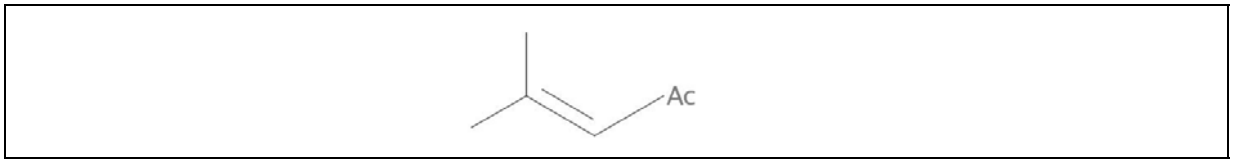
1. General Statement

4-methylpent-3-en-2-one is a colourless liquid highly soluble in water. It is an oxygenated solvent commonly named Mesityl Oxyde (OM). It is a flammable liquid and an irritant product.

OM is manufactured, used and formulated within industrial and professional settings. This substance is also present in some specific preparations used by consumers.

2. Chemical Identity

Name:	4-methylpent-3-en-2-one
Brand names:	OM
Chemical name (IUPAC):	4-methylpent-3-en-2-one
CAS number(s):	141-79-7
EC number:	205-502-5
Molecular formula:	$C_6H_{10}O$
Structure:	



3. Use and applications

The major use of 4-methylpent-3-en-2-one is as an intermediate and as a solvent, in the coatings, fine chemical, and agrochemical industries.

- General industry: manufacturing of ketones, glycol ethers, MIBK, MIBC, DIBK…,
- Perfume and fragrance: intermediate for synthesis,
- Pharmaceuticals: synthesis of Vitamin C derivatives (ascorbic acid esters...),
- Others: good solvent for PVC paint and coatings, preparation of concentrated solutions of herbicides and fungicides, flotation agent, synthesis of organic peroxides.

4. Physical / Chemical properties

4-methylpent-3-en-2-one is a flammable liquid organic substance having the following characteristics and physico–chemical properties:

Property	Value
Physical state	Liquid at 20°C and 1013 hPa
Colour	Colourless

Odour	Characteristic
Molecular weight	98.14 g/mol
Density	0.8592 at 15°C
Vapour pressure	19.31 hPa at 25°C
Freezing / boiling points	-53°C / 135°C at 1013hPa
Flammability	Flammable liquid and vapour
Flash point	25°C (closed cup)
Self-ignition temperature	335°C at 1013 hPa
Explosive / oxidizing properties	Not relevant based on its structure
Water solubility	26.98 g/L at 20°C (highly soluble at 20°C)
Dissociation constant (pK_a)	Not relevant based on its structure
Octanol-water partition coefficient (Log K_{ow})	1.37 at 20°C

5. Health Effects

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Harmful by ingestion, toxic by inhalation and of low toxicity by dermal exposure.
Irritation / corrosion Skin / eye/ respiratory tract	Irritating to the skin, eyes and respiratory tract.
Sensitisation	Not sensitising
Toxicity after repeated exposure Oral / inhalation / dermal	Repeated exposures of rats by inhalation induce an irritation of the respiratory tract.
Genotoxicity / Mutagenicity	Not genotoxic
Carcinogenicity	No carcinogenic effects expected based on the lack of genotoxicity and low toxicity profile of the substance.
Reproductive / Developmental Toxicology	Slight effects were observed on fertility and foetal development in treated laboratory rats.

6. Environmental Effects

The potential of 4-methylpent-3-en-2-one for bioaccumulation is low. This product will not persist in the environment. It is harmful to aquatic organisms.

Effect Assessment	Result
Aquatic Toxicity	Harmful to aquatic organisms

Fate and behaviour	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not expected to bioaccumulate
PBT / vPvB conclusion	Not considered as PBT* or vPvB**

*: Persistent, Bioaccumulative and Toxic (PBT)
**: very Persistent and very Bioaccumulative (vPvB)

7. Exposure

7.1 Human health

4-methylpent-3-en-2-one is used as an intermediate handled under strictly controlled conditions as described in Article 18(3) of the REACH regulation and as a solvent for chemical synthesis. For this latter, an exposure assessment and risk characterization have been carried out.

The primary routes of industrial exposure of 4-methylpent-3-en-2-one are skin contact and inhalation, ingestion is not an anticipated route of exposure. Workers may be exposed during cleaning, maintenance, transfer, sampling and analysis.

Based on the risk assessment, the exposure can be kept at a safe level (strictly below occupational exposure limits, when applied) when activities are carried out under conditions recommended in the Extended Safety Data Sheet (see Chap. 8 and Exposure Scenarios).

Procedures, controls, suitable collective and personal risk management measures, good industrial hygiene practices and risk and communication through appropriate training of workers should be implemented.

In case of exposure to the undiluted substance, workers should follow the first aid measures recommended in the Safety Data Sheet.

7.2 Environment

Regarding the uses not as intermediate handled under strictly controlled conditions, an assessment of the environmental exposure was made for all the uses and resulted life cycle stages of the substance from the manufacture to the waste stage.

4-methylpent-3-en-2-one is manufactured and used in continuous or batch processes within industrial settings.

Based on the risk assessment, environmental exposure can be kept at a safe level when activities are carried out under conditions recommended in the extended Safety Data Sheet (see Chap. 6, and Exposure Scenarios).

All industrial aqueous releases that may contain the substance must be destroyed to avoid any exposure to the environment.

Disposal, treatment or recycling of industrial waste must comply with applicable regulations to preserve the environment.

Procedures, controls and risk management measures should be implemented on industrial manufacturing and application sites; effluents that may contain the substance must be treated to avoid any exposure to the environment.

8. Risk Management recommendations

Human health measures	
Organizational	Collect the latest available Safety Data Sheet. Implement good basic standards of occupational health. Ensure operatives are well informed of the hazards and trained to minimise exposures. Handle and store according to the indications of the Safety Data Sheet.
Engineering controls	Provide appropriate local exhaust ventilation at points of emission. Ensure that eye- and handwash stations and safety showers are close to workstation locations.

Protection	**Eye/Face protection:**	Safety glasses with side-shields.
	Skin and body protection:	At the workplace: Protective clothing (cotton) Intervention at incident: Waterproof suit.
	Hand protection:	Gloves (Polyvinylchloride, neoprene), tested to EN374:1.
	Respiratory protection:	Low concentrations or short activity: Mask with specific cartridge Recommended Filter type: A2B2E2K2P3. High concentrations or prolonged activity: Self contained Breathing Apparatus.

Environment protective measures
Do not release into the environment. Do not let product enter drains. Use waste water treatment systems. Do not spread sludge to soil. Elimination: Destroy the product by incineration (in accordance with local and national regulations) (see chap. 6 of the Safety Data Sheet).

9. Regulatory Information / Classification and Labelling

9.1 Regulatory Information

This substance has been registered under:

— EU Regulation EC 1907/2006 (REACH)

9.2 Classification and labelling

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the eSDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according to CLP (EC) 1272/2008, implementation of the GHS in the European Union.

Classification
According to REGULATION (EC) no 1272/2008: — Flammable liquids: Category 3 — Acute toxicity – Oral: Category 4 — Acute toxicity – Dermal: Category 4 — Acute toxicity – Inhalation: Category 3 — Skin irritation: Category 2 — Eye irritation: Category 2 — Specific target organ toxicity - single exposure (inhalation): Category 3
Signal word
Danger
Pictogram

— GHS02: flame	

— GHS06: skull and crossbones	

Hazard statement

- 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.

Alternative classification according to Globally Harmonized System (GHS)

- Flammable liquids: Category 3, H226: Flammable liquid and vapour.
- Acute toxicity – Oral: Category 4, H302: Harmful if swallowed.
- Acute toxicity – Dermal: Category 5, H313: May be harmful in contact with skin.
- Acute toxicity – Inhalation: Category 3, H331: Toxic if inhaled.
- Skin irritation: Category 2, H315: Causes skin irritation.
- Eye irritation: Category 2A, H319: Causes serious eye irritation.
- Specific target organ toxicity - single exposure (inhalation): Category 3, H335: May cause respiratory irritation.
- Acute aquatic toxicity, Category 3, H402: Harmful to aquatic life.

10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

- arkema-thio-reach-uses@arkema.com
- **ICCA portal where the GPS Safety Summary is posted**: http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/

11. Date of Issues / Revision

- Date of issue: 2014/10/31
- Date of revision:

12. Disclaimer

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