GPS Safety Summary

Substance Name:

4-methylpentan-2-one

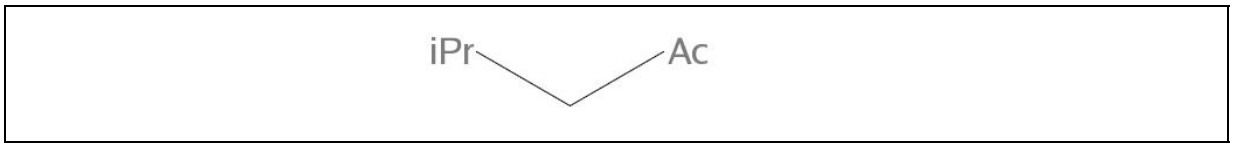
1. General Statement

4-methylpentan-2-one is a colourless liquid highly soluble in water. It is an oxygenated solvent commonly named MIBK. It is a highly flammable liquid and an irritant product.

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

2. Chemical Identity

Name:	4-methylpentan-2-one
Brand names:	MIBK
Chemical name (IUPAC):	4-methylpentan-2-one
CAS number(s):	108-10-1
EC number:	203-550-1
Molecular formula:	$C_6H_{12}O$
Structure:	



3. Use and applications

The main applications of MIBK are:

- **Paints and Varnishes:** Excellent solvent for various paints (industrial and architectural)
- **Textile and leather:** solvent and synthesis of additives
- **Rubber industry:** Antioxydant and anti ozonant in rubber additives for tyres.
- **Chemical synthesis:** Extraction solvent and solvent for chemical synthesis – pharmaceuticals (antibiotics, aspartame...), agrochemicals (fungicide, germicide...)
- **Others: adhesives, inks, separation and purification of metal ions, surfactant, dry cleaning agent, semi conductors.**

4. Physical / Chemical properties

4-methylpentan-2-one is a highly flammable liquid organic substance having the following characteristics and physical–chemical properties:

Property	Value
Physical state	liquid at 20°C and 1013 hPa
Colour	colourless
Odour	characteristic
Molecular weight	100.16 g/mol
Density	0.7978 g/cm^3 at 20°C
Vapour pressure	20.93 hPa at 20°C 26.4 hPa at 25°C
Freezing / boiling points	-84°C / 116-118°C at 1013hPa
Flammability	Highly flammable liquid and vapour
Flash point	15-23°C (closed cup)
Self-ignition temperature	448-460°C at 1013 hPa
Explosive / oxidizing properties	Not relevant based on its structure
Water solubility	14.1 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})	1.9

5. Health Effects

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	May be harmful by oral route. Harmful by inhalation exposures. Practically non toxic in contact with the skin
Irritation / corrosion Skin / eye/ respiratory tract	Not irritating to the skin, minimally irritating to the eyes and irritating to the respiratory tract
Sensitisation	No evidence of skin sensitisation
Toxicity after repeated exposure Oral / inhalation / dermal	No significant systemic toxicity following repeated oral and inhalation administration
Genotoxicity / Mutagenicity	No evidence of genetic toxicity
Carcinogenicity	No carcinogenic effect relevant to humans was observed in animal studies
Reproductive / Developmental Toxicology	No effect on fertility and foetal development was observed in animal studies

6. Environmental Effects

The potential of 4-methylpentan-2-one for bioaccumulation is low. This product will not persist in the environment. It is slightly harmful to aquatic organisms. Do not release in the environment.

Effect Assessment	Result
Aquatic Toxicity	Slightly harmful to aquatic organisms

Fate and behaviour	Result
Biodegradation	Readily biodegradable

Other degradation (optional)	
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-methylpentan-2-one is manufactured, used and formulated within industrial and professional settings. Consumers may also be exposed to 4-methylpentan-2-one (MIBK) when present in mixtures used in coatings, as cleaning agents, and in agrochemicals.

The primary routes of industrial exposure of MIBK are skin contact and inhalation, ingestion is not 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 Safety Data Sheet.

7.2 Environment

MIBK is manufactured and used in continuous or batch processes within industrial settings.

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

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

Please see chap 6 of the Safety Data Sheet regarding environmental precautions.

8. Risk Management recommendations

Human health measures	
Organizational	Collect the latest available Safety Data Sheet. Implement good basic standards of occupational hygiene. 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 / Intervention at incident : Protective clothing (cotton)
	Hand protection:	Intermittent contact: Gloves (Polyvinylchloride, neoprene, nitrile rubber), tested to EN374:1 Prolonged contact: Impervious butyl rubber gloves
	Respiratory protection:	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.		

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 CLP (EC) 1272/2008, implementation of the GHS in the European Union.

Classification	
According to Annex VI of REGULATION (EC) no 1272/2008: — Flammable liquids: Category 2 — Acute toxicity – Inhalation: Category 4 — Eye irritation: Category 2 — Specific target organ toxicity - single exposure (inhalation): Category 3	
Signal word	
Danger	
Pictogram	
— GHS02: flame	
— GHS07: exclamation mark	
Hazard statement	
— H225: Highly flammable liquid and vapour. — H332: Harmful if inhaled.	

— H319: Causes serious eye irritation. — H335: May cause respiratory irritation.
Alternative classification according to Globally Harmonized System (GHS)
— Flammable liquids: Category 2 — Acute toxicity – oral: Category 5 — Acute toxicity – Inhalation: Category 4 — Specific target organ toxicity - single exposure (inhalation): Category 3

10. Contact Information within Company

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

— arkema-thiochem-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: 2014/08/31

— Date of revision:

12. Disclaimer

The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.

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