Material Safety Data Sheet

Version 4.0
Revision Date 05/26/2010
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1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	4-Methyl-2-pentanone
Product Number	:	537713
Brand	:	Sigma-Aldrich
Company	:	Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA
Telephone	:	+18003255832
Fax	:	+18003255052
Emergency Phone #	:	(314) 776-6555

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards

Flammable liquid, Target Organ Effect, Highly toxic by inhalation, Irritant

Target Organs

Nerves.

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H303	May be harmful if swallowed.
H316	Causes mild skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

HMIS Classification

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	3
Physical hazards:	0

NFPA Rating

Health hazard:	2
Fire:	3
Reactivity Hazard:	0

Potential Health Effects

Inhalation	May be fatal if inhaled. Causes respiratory tract irritation.
Skin	May be harmful if absorbed through skin. Causes skin irritation. Repeated exposure may cause skin dryness or cracking.
Eyes	Causes eye irritation.
Ingestion	May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Isobutyl methyl ketone
Methyl isobutyl ketone
Isopropylacetone

Formula : $C_6H_{12}O$
Molecular Weight : 100.16 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
4-Methylpentan-2-one			
108-10-1	203-550-1	606-004-00-4	-

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in cool place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
4-Methylpentan-2-one	108-10-1	TWA	50 ppm 205 mg/m3	1994-09-01	USA. ACGIH Threshold Limit Values (TLV)
Remarks	Substances for which there is a Biological Exposure Index or Indices (see BEI® section)				
		STEL	75 ppm	2008-01-01	USA. ACGIH Threshold Limit Values (TLV)
	Eye & Upper Respiratory Tract irritation Kidney damage Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Error correction: in the 2007 Notice of Intended Changes the indicated MW is 225.16 g/mol. This is corrected into 100.16 g/mol				
		TWA	50 ppm 205 mg/m3	1989-01-19	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		STEL	75 ppm 300 mg/m3	1989-01-19	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	100 ppm 410 mg/m3	1997-08-04	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	The value in mg/m3 is approximate.				
		TWA	50 ppm	2008-01-01	USA. ACGIH Threshold Limit Values (TLV)
	Eye & Upper Respiratory Tract irritation Kidney damage Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Error correction: in the 2007 Notice of Intended Changes the indicated MW is 225.16 g/mol. This is corrected into 100.16 g/mol				

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific

workplace.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid

Safety data

pH	no data available
Melting point	-80 °C (-112 °F) - lit.
Boiling point	117 - 118 °C (243 - 244 °F)
Flash point	14 °C (57 °F) - closed cup
Ignition temperature	459 °C (858 °F)
Lower explosion limit	1.2 %(V)
Upper explosion limit	8 %(V)
Vapour pressure	20 hPa (15 mmHg) at 20 °C (68 °F)
Density	0.801 g/cm3 at 25 °C (77 °F)
Water solubility	ca.20 g/l
Partition coefficient: n-octanol/water	log Pow: 1.31
Relative vapour density	3.46 - (Air = 1.0)

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
Vapours may form explosive mixture with air.

Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

Materials to avoid
Oxidizing agents, Strong bases

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity
LD50 Oral - rat - 2,080 mg/kg

LC50 Inhalation - rat - 4 h - 8.2 - 16.4 mg/m3

LD50 Dermal - rabbit - > 16,000 mg/kg

Skin corrosion/irritation
Skin - rabbit - Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - rabbit - Moderate eye irritation - 24 h

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

Developmental Toxicity - mouse - Inhalation
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Developmental Toxicity - mouse - Inhalation
Specific Developmental Abnormalities: Central nervous system. Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Specific target organ toxicity - single exposure (GHS)
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure (GHS)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be fatal if inhaled. Causes respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. Causes skin irritation. Repeated exposure may cause skin dryness or cracking.
Eyes	Causes eye irritation.

Signs and Symptoms of Exposure
Blurred vision, Dermatitis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Additional Information
RTECS: SA9275000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	LC0 - Leuciscus idus melanotus - 480 mg/l - 48 h
Toxicity to daphnia and other aquatic invertebrates.	EC50 - Daphnia magna (Water flea) - 1,550 - 3,623 mg/l - 24 h
Toxicity to algae	EC50 - Desmodesmus subspicatus (green algae) - 980 - 2,000 mg/l - 48 h

Persistence and degradability

Biodegradability	Biotic/Aerobic

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment

no data available

Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 1245 Class: 3 Packing group: II
Proper shipping name: Methyl isobutyl ketone
Reportable Quantity (RQ): 5000 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN-Number: 1245 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHYL ISOBUTYL KETONE
Marine pollutant: No

IATA
UN-Number: 1245 Class: 3 Packing group: II
Proper shipping name: Methyl isobutyl ketone

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid, Target Organ Effect, Highly toxic by inhalation, Irritant

DSL Status
All components of this product are on the Canadian DSL list.

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

	CAS-No.	Revision Date
4-Methylpentan-2-one	108-10-1	1993-04-24

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
4-Methylpentan-2-one	108-10-1	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
4-Methylpentan-2-one	108-10-1	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
4-Methylpentan-2-one	108-10-1	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.