



MATERIAL SAFETY DATA SHEET

Acetaldehyde

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Acetaldehyde

SYNONYMS: Ethanal, Acetic Aldehyde

MOLECULAR FORMULA: C₂H₄O

MOLECULAR WEIGHT: 44.05 g/mol

CREATION DATE: Mar 02 2007

CONTACT PERSON:

Mr. S.G.Mokashi
Godavari Biorefineries Ltd.
45-47, Somaiya Bhavan
M.G.Road, P.O.Box384
Fort, Mumbai 400001
Tel: 0091 22 22048272
Fax: 0091 22 22047297

REVISION DATE: Jan 13 2016

2. HAZARDS IDENTIFICATION

Potential Acute Health Effects:

Hazardous in case of eye contact (irritant), of ingestion, of inhalation (lung irritant)
Slightly hazardous in case of skin contact (irritant, permeator)

Potential Chronic Health Effects:

Hazardous in case of skin contact (irritant)
Slightly hazardous in case of skin contact (sensitizer)

CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. **MUTAGENIC EFFECTS:** Mutagenic for mammalian somatic cells
Mutagenic for bacteria and/or yeast

TERATOGENIC EFFECTS: Classified POSSIBLE for human

DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to liver. Repeated or prolonged exposure to the substance can produce Target organs damage

3. COMPOSITION, INFORMATION ON INGREDIENTS

CAS No.	EC No.	Chemical Name	Percent
75-07-0	200-836-8	Acetaldehyde	>99.5

4. FIRST AID MEASURES

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Not available.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

5. FIRE FIGHTING MEASURES

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 175°C (347°F)

Flash Points : CLOSED CUP: -38°C (-36.4°F) OPEN CUP: -40°C (-40°F) Flammable
Limits : LOWER: 4% UPPER: 55%
Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:

Extremely flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of heat, of acids, of alkalis. Non-explosive in presence of shocks.

Fire Fighting Media and Instructions:

Flammable liquid, soluble or dispersed in water.

SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use Mechanical foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, auto ignition or explosion.

Special Remarks on Fire Hazards:

When heated to decomposition it emits acrid smoke and fumes.

Special Remarks on Explosion Hazards:

Hazardous or explosive polymerization may occur with acids, alkaline materials, heat, strong bases, trace metals. Forms explosive peroxides on exposure to air, heat or sunlight

Environmental precautions

Water runoff can cause environmental damage. Dyke and collect water used to fight fire.

Other Information

Cool containers / tanks with water spray

6. ACCIDENTAL RELEASE MEASURES

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill:

Flammable liquid, Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS.

7. HANDLING AND STORAGE

Precautions:

Keep locked up. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment.

If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, combustible materials, organic materials, metals, acids, and alkalis.

Storage:

Store in a segregated and approved area

Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves (impervious).

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 25 (ppm) from ACGIH (TLV) [United States]

TWA: 200 STEL: 150 (ppm) from OSHA (PEL) [United States].

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance:	Clear Liquid
Odor:	Fruity, Pungent (Strong)
Taste:	Leafy green
Color:	Colorless
pH (1% soln/water):	Not available
Boiling Point:	21°C (69.8°F)
Melting Point:	-123.5°C (-190.3°F)
Critical Temperature:	188°C (370.4°F)
Specific Gravity:	0.78 (Water = 1)

Vapor Pressure:	101.3 kPa (@ 20°C)
Vapor Density:	1.52 (Air = 1)
Volatility:	Not available
Odor Threshold:	0.21 ppm
Water/Oil Dist. Coeff.:	Not available
Ionicity (in Water):	Not available
Dispersion Properties:	See solubility in water, diethyl ether, acetone
Solubility:	Easily soluble in cold water, hot water. Soluble in diethyl ether, acetone Miscible with benzene, gasoline, solvent naphtha, toluene, xylene, turpentine Solubility in water: 1000 g/l @ 25 °C

10. STABILITY AND REACTIVITY

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources (flames, sparks), incompatible materials

Incompatibility with various substances: Highly reactive with metals, acids, alkalis. Reactive with oxidizing agents, combustible materials, organic materials.

Corrosivity: Non-corrosive in presence of glass

Special Remarks on Reactivity: Reacts with oxidizing materials, halogens, amines, strong alkalies (bases), and acids, cobalt acetate, phenols, ketones, ammonia, hydrogen cyanide, hydrogen sulfide, hydrogen peroxide, mercury (II) salts (chlorate or perchlorate), acid anhydrides, alcohols, iodine, isocyanates, phosphorus, phosphorus isocyanate, tris(2-chlorobutyl)amine. It can slowly polymerize to paraldehyde. Polymerization may occur in presence of acid traces causing exothermic reaction, increased vessel pressure, fire, and explosion. Impure material polymerizes readily in presence of traces of metals (iron) or acids. Acetaldehyde is polymerized violently by concentrated sulfuric acid. Acetaldehyde can dissolve rubber.

Special Remarks on Corrosivity: Not available.

Polymerization: Not available

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 661 mg/kg [Rat.]. Acute dermal toxicity (LD50): 3540 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 23000 mg/m³ 4 hours [Mouse].

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC.

MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.

TERATOGENIC EFFECTS: Classified POSSIBLE for human. May cause damage to the following organs: liver.

Other Toxic Effects on Humans: Hazardous in case of ingestion, of inhalation (lung irritant). Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data May affect genetic material (mutagenic). May cause cancer based on animal test data

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects:

Skin: Causes mild skin irritation. It can be absorbed through intact

Other Toxic Effects on Humans: Hazardous in case of ingestion, of inhalation (lung irritant). Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data May affect genetic material (mutagenic). May cause cancer based on animal test data

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes mild skin irritation. It can be absorbed through intact skin.

Eyes: Causes severe eye irritation. Eye splashes produce painful but superficial corneal injuries which heal rapidly. Inhalation: It causes upper respiratory tract and mucous membrane irritation. It decreases the amount of pulmonary macrophages. It may cause bronchitis. It may cause pulmonary edema, often the cause of delayed death. It may affect respiration (dyspnea) and respiratory arrest and death may occur. It may affect behavior/central nervous and cause central nervous system depression.

Irritation usually prevents voluntary exposure to airborne concentrations high enough to cause CNS depression, although this effect has occurred in experimental animals. It may also affect the peripheral nervous system and cardiovascular system (hypotension

or hypertension, tachycardia, radycardia), kidneys (albuminuria) Chronic Potential

Health Effects: Skin:

Prolonged direct skin contact causes erythema and burns. Repeated exposure may cause dermatitis secondary to primary irritation or sensitization. Ingestion: Symptoms of chronic Acetaldehyde exposure may resemble those of chronic alcoholism.

Acetaldehyde is the a metabolite of ethanol in humans and has been implicated as the active agent damaging the liver in ethanol-induced liver disease.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

13. DISPOSAL CONSIDERATIONS

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

Dispose of as unused product

14. TRANSPORT INFORMATION

US Department of Transportation

UN/NA Number	UN 1089
Proper Shipping Name	Acetaldehyde
Hazard class	3
Packing Group	1
Reportable Quantity -(RQ)	1000 lb/454kg
Emergency Response. Guide no	129

ADR/RID of transportation

UN/ID No	UN 1089
Proper Shipping Name	Acetaldehyde
Hazard Class	3
Packing group	1
Hazard Number	33

ADNR ADNR:
UN/ID No

Container and Tanker
UN 1089

15. REGULATORY INFORMATION

Labeling in accordance with EC directives

Symbol(s)

F+ Extremely flammable

Xn Harmful

R-phrases(s)

R12 Extremely flammable

R40 Limited evidence of a carcinogenic effect

R36/37 Irritating to eyes and respiratory system

S-phrases(s)

S16 Keep away from sources of ignition - No smoking

S33 Take precautionary measures against static discharges.

S36/37 Wear suitable protective clothing and gloves

International Chemical Inventory

Listed on the chemical inventories of the following countries or qualifies for an exemption:

EUROPE,

16. OTHER INFORMATION

The information in this safety data sheet is based on data and samples provided. The sheet was written to the best of our ability and according to the state of knowledge at that time. The safety data sheet only constitutes a guideline for the safe handling, use, consumption, storage, transport and disposal of the substances/preparations/mixtures mentioned under point 1. New safety data sheets are written from time to time. Only the most recent versions may be used. Old versions must be destroyed. Unless indicated otherwise word for word on the safety data sheet, the information does not apply to substances/preparations/mixtures in purer form, mixed with other substances or in processes.

The safety data sheet offers no quality specification for the substances/preparations/mixtures in question. Compliance with the instructions in this safety data sheet does not release the user from the obligation to take all measures dictated by common sense, regulations and recommendations or which are necessary and/or useful based on the real applicable circumstances. Godavari Biorefineries Limited does not guarantee the accuracy or exhaustiveness of the information provided.