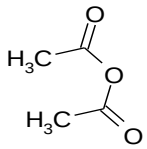
Date of Compilation	: March 06, 2012
Date of Revision	: January 30, 2024
Revision Number	: 20
Version Number	: 0028Gj Ghs20 Div.1 sds Acetic anhydride
Revision due date	: December 2026
Supersedes date	: October 25, 2021
Supersedes version	: 0028Gj Ghs19 Div.1 sds Acetic anhydride

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

PRODUCT NAME	: Acetic Anhydride
CAS RN	: 108-24-7
EC#	: 203-564-8
SYNONYMS	: Acetyl oxide; Acetyl acetate; Acetyl ether; Ethanoic anhydride.
SYSTEMATIC NAME	: Acetic acid, anhydride, Acetic anhydride
MOLECULAR FORMULA	: $C_4H_6O_3$
STRUCTURAL FORMULA	



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

1.2.1. Relevant identified uses

It is used as Formulation, as a laboratory reagent. It is also used to make cellulose acetate, pharmaceuticals, detergents and other chemicals.

Uses advised against: None

1.3. Details of the supplier of the safety data sheet

Jubilant Ingrevia Limited
FACTORY AND REGISTERED OFFICE:
Jubilant Ingrevia Limited
Bhartiagram, Gajraula, District: Amroha Uttar Pradesh-244223 (India) T +91-5924-267437& +91-5924-267438

HEAD OFFICE:
Jubilant Ingrevia Limited
Plot 1-A, Sector 16-A, Institutional Area, Noida, Uttar Pradesh, 201301 – India
T +91-120-4361000 - F +91-120-4234881 / 84 / 85 / 87 / 95 / 96 support@jubl.com - www.jubilantingrevia.com

1.4. Emergency telephone number

For Chemical Emergency ONLY (in the case of fire, leak, spill, exposure or accident) Call

Chemtrec: 1-800-424-9300 (US), 1-703-527-3887 (Outside U.S.)

Chemtrec (India) : 000-800-100-7141

For ALL other emergencies call **Emergency Control Room Gajraula at 99970 22412**

SECTION 2: HAZARD(S) IDENTIFICATION

2.1. Classification of the substance or mixture

GHS-US classification

Flammable Liquid: Category 3	H226	Flammable liquid and vapor.
Acute Toxicity (Oral): Category 4	H302	Harmful if swallowed.
Skin irritation: Category 1B	H314	Causes severe skin burns and eye damage.
Acute Toxicity (Inhalation): Category 2	H330	Fatal if inhaled.

2.2. Label Elements

Hazard Pictogram: GHS 02, GHS05, GHS06
Signal Word: Danger!

GHS02 – Flammable *GHS05 – Corrosive* *GHS06-Skull and cross bones*

HAZARD AND PRECAUTIONARY STATEMENTS:

HAZARD STATEMENTS

- H226: Flammable liquid and vapour.
- H302: Harmful if swallowed.

- H314: Causes severe skin burns and eye damage
- H330: Fatal if inhaled.

PRECAUTIONARY STATEMENTS

- P210: Keep away from heat/sparks/open flames/.../hot surfaces. ... No smoking.
- P233: Keep container tightly closed.
- P240: Ground/bond container and receiving equipment.
- P241: Use explosion-proof electrical/ventilating/lightning/…/equipment.
- P242: Use only non-sparking tools.
- P243: Take precautionary measures against static discharge.
- P260: Do not breathe dust/fume/gas/mist/vapour/spray
- P264: Wash hands thoroughly after handling.
- P270: Do not eat, drink or smoke when using this product.
- P271: Use only outdoors or in a well-ventilated area
- P280: Wear protective gloves/protective clothing/eye protection/face protection
- P284: Wear respiratory protection.
- P310: Immediately call a POISON CENTER or doctor/physician.
- P363: Wash contaminated clothing before reuse.
- P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P330: Rinse mouth.
- P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing
- P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P370+P378: In case of fire, use water for extinction.
- P403+P233: Store in a well-ventilated place. Keep container tightly closed
- P405: Store locked up.
- P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3. Other hazards

- This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
- This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical	CAS #	EC#	Purity	GHS-US classification
Acetic Anhydride	108-24-7	203-564-8	~ 99.0%	Skin irritation: Category 1B Flammable Liquid: Category 3 Acute Toxicity (Inhalation): Category 2 Acute Toxicity (Oral): Category 4

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Key symptoms

Acute effects

Small amount of liquid causes ...burning discomfort ...followed some hrs later by increased severity of reaction, with corneal and conjunctival edema. Interstitial corneal opacity may develop.... Inhalation causes/ ...coughing and a burning sensation in nose and throat.

Chronic effects

In persons with impaired pulmonary function, especially those with obstructive airway diseases, the breathing of acetic anhydride might cause exacerbation of symptoms due to its irritant properties. Skin disease: Acetic anhydride is a primary skin irritant. Persons with pre-existing skin disorders may be more susceptible to the effects of this agent. Eye disease: Acetic anhydride is a severe eye irritant and may cause tissue damage. Those with pre-existing eye problems may be at increased risk from exposure.

FIRST AID

- **Eyes**: Symptoms: Lachrymator, redness, severe burns.
- If in eyes rinse cautiously with water for at least 15 minutes. Remove contact lenses if easy to do so. Continue rinsing. Seek immediate medical attention.

- **Skin:** Corrosive. Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.
- **Inhalation**: Symptoms: Corrosive. Cough. Laboured breathing. Shortness of breath. Sore throat. Symptoms may be delayed. The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if you feel unwell.
- **Ingestion**: Symptoms: Corrosive. Abdominal pain. Sore throat. Collapse. If swallowed call a poison center if you feel unwell. Rinse mouth. Do NOT induce vomiting by use of emetics. Seek prompt/immediate medical attention.

Advice

- IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- Rinse mouth.
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- Immediately call a POISON CENTER or doctor/physician.

SECTION 5 : FIRE-FIGHTING MEASURES

5.1. Extinguishing media

- *Appropriate extinguishing media*: Water fog, alcohol resistant foam, dry chemical or carbon dioxide extinguisher or water spray. Do NOT use water jets. Major fires may be extinguished with flooding amounts of water from a distance. Water spray may be used to knock down vapors.

5.2. Special Protective Equipment and Precautions for Fire Fighter

- Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Do not breathe vapors.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Always stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

5.3. Unusual fire and explosion hazard

- Consider isolating the fire when it involves the material and permitting it to burn itself out. Do not allow water to enter container, because of exothermic reaction.
- Flashback along vapor trail may occur. Closed container exposed to heat may explode. Irritating vapors and toxic fumes of carbon monoxide may be released in fore conditions.
- Consider isolating the fire when it involves the material and permitting it to burn itself out. Move all personnel out of the fire area. Move away in event of any explosion. Keep at safe distance.
- Do not allow water to enter container, because of exothermic reaction.
- Flashback along vapor trail may occur. Closed container exposed to heat may explode. Irritating vapors and toxic fumes of carbon monoxide may be released in fore conditions.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

- Wear protective clothing, full boots, impervious gloves, safety glasses and Self Contained Breathing Apparatus (SCBA), as may be deemed appropriate.
- Avoid breathing vapors and contact with skin and eyes.
- Shut off leak source if possible.
- Shut off all possible sources of ignition.
- Wipe up.
- Decontaminate all equipment.
- Use non-sparking tools.

6.1.2 For emergency personnel

- Wear protective clothing, full boots, impervious gloves, safety glasses and Self Contained Breathing Apparatus (SCBA), as may be deemed appropriate.
- Alert Emergency Responders and tell them location and nature of hazard.
- Shut off all possible sources of ignition and increase ventilation.
- Stop leaks if possible.
- Clean up all spills immediately following relevant Standard Operating Procedures.
- Avoid breathing vapors and contact with skin and eyes.
- Use non-sparking tools.

6.2. Environmental precautions

- Clean up all spills immediately following relevant Standard Operating Procedures.
- Inform authorities in event of contamination of any public sewers, drains or water bodies.
- Wipe up.

- Prevent, by any means available, spillage from entering drains or water and watercourses.
- Collect recoverable product into labeled containers for recycling, recovery or disposal.
- Contain spill with sand, earth or vermiculite.
- Spread area with lime or absorbent material, and leave for at least 1 hour before washing.

6.3. Methods and material for containment and cleaning up

6.3.1: Containment of the spill.

(a) Bunding, covering of drains.

- Alert Emergency Responders and tell them location and nature of hazard.
- Shut off all possible sources of ignition and increase ventilation.
- Wear protective clothing, full boots, impervious gloves, safety glasses and Self Contained Breathing Apparatus (SCBA), as may be deemed appropriate.
- Stop leaks if possible.
- Prevent, by any means available, spillage from entering drains or water and watercourses.
- Collect recoverable product into labeled containers for recycling, recovery or disposal.
- Contain spill with sand, earth or vermiculite.
- Clean up all tools and equipment.
- Inform authorities in event of contamination of any public sewers, drains or water bodies.

(b) Capping procedure.

- Clean up all spills immediately following relevant Standard Operating Procedures.
- Avoid breathing vapors and contact with skin and eyes.
- Shut off leak source if possible.
- Shut off all possible sources of ignition.
- Wipe up.
- Decontaminate all equipment.
- Use non-sparking tools.

6.3.2 Cleanup procedure (Any of the following)

(a) Neutralization techniques;
(b) Decontamination techniques;
(c) Adsorbent material;

- Spread area with lime or absorbent material, and leave for at least 1 hour before washing.

(d) Cleaning Techniques;
(e) Vacuuming techniques;
(f) Equipment required for containment/Cleanup (include the use of non-sparking tools and equipment where applicable).

6.4. Reference to other sections

- For more information please refer to section 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

- Do not breathe vapor or mist.
- Wear protective gloves/clothing and eye/face protection.
- Wash thoroughly after handling.
- Ground and secure containers when dispensing or pouring product.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Launder contaminated clothing before re-use.
- If on skin or hair, IMMEDIATELY remove all contaminated clothing and rinse/shower with plenty of water.
- Use in a well-ventilated place/Use protective clothing commensurate with exposure levels.

7.2. Storage

- Store at ambient temperature in a dry and well ventilated place.
- Store in a flame proof area.
- Store away from incompatible materials.
- Keep only in original container.
- Keep securely closed when not in use.

German storage class

- 3A: Flammable liquids

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

8.1.1. Exposure Limits Values

Exposure Limits 1 ppm = 4.17 mg/m^3

- TLV: 5 ppm as TWA (ACGIH 2006).

- MAK: 5 ppm (21 mg/m³)
- OSHA PEL: TWA 5 ppm (20 mg/m³)
- NIOSH REL: C 5 ppm (20 mg/m³)
- NIOSH IDLH: 200 ppm
- TEELs
  - TEEL1: 5 ppm (TEELS, 2001)
  - TEEL2: 5 ppm (TEELS, 2001)
  - TEEL3: 200 ppm (TEELS, 2001)

8.1.2. Derived No-Effect-Levels (DNEL) / Predicted No-effect-concentration (PNEC)

PNEC	**Water (Freshwater)**	**Sediment (Freshwater)**	**Soil**	**Sewage treatment plant**
	3.058 mg /L.	11.36 mg /kg sediment dw	0.47 mg/Kg soil dw	115 mg/L

DNEL	**Dermal**	**Inhalation**	**Oral**
Workers		12.6 mg/m³	

Discussion: No consumer exposure anticipated therefore no DNELs proposed for General Population.

Acute Toxicity (Oral/Dermal/Inhalation)

- Local effects at the site of first entry dominate the acute oral and inhalation toxicity profiles of acetic anhydride. Following inhalation exposure, severe irritation of the respiratory tract has been reported, with oral administration ulceration of the stomach. Although there is little quantitative information available on the acute effects of a single exposure to acetic anhydride in humans, there is evidence from accidental exposure that, qualitatively, similar effects are likely to occur in humans. A dermal acute toxicity study with acetic anhydride in rabbits reported low toxicity by this route of exposure.

Irritation/Corrosivity (Skin/eyes/Respiratory tract):

- Although no modern skin or eye animal studies have been conducted, the weight of evidence indicates that the liquid material is likely to be a severe eye irritant, whilst the vapour irritant to the eyes and respiratory tract. In humans severe irritation of the eyes and respiratory tract resulted from exposure to the vapour/aerosol and the liquid is corrosive to skin.

Repeated dose Toxicity, sub-acute/sub chronic/chronic (Oral/Dermal/Inhalation):

- Local irritation/corrosion effects at the site of first contact (eyes and respiratory system) are the effects of concern for acetic anhydride. A clear NOAEC of 1 ppm (4.18 mg/m3) was established in a guideline 13-week study (HRC, 1996).
  The weight of evidence indicates that acetic acid will be very rapidly and extensively formed in vivo following exposure to acetic anhydride. There is sufficient evidence from animal and human investigations with acetic acid, and from human studies on acetate intake and removal to conclude that systemic toxicity following exposure to acetic anhydride, at concentrations below those inducing local toxicity, is extremely unlikely.

8.2. Exposure controls

Appropriate Engineering Controls:

- Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. Local ventilation is usually preferred. Ensure that eyewash stations and safety showers are close to the workstation location.

8.3. Personal Protection

- Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier. Liquid is volatile and causes little irritation on uncovered skin. However, causes severe burns when clothing is wet with the chemical or if it enters gloves or shoes.
- **Eyes**: Safety goggles/ Chemical Safety glasses and Face shield.
- **Hands :**BUTYL GLOVES > 3 hours
  NAT RUB GLOVES < 1 hour
  NEOPRENE GLOVES > 3 hours
  PE/EVAL/PE GLOVES > 3 hours
  PTFE TEFLON FABRIC > 3 hours
  PVC GLOVES < 1 hour
- **Clothing**: Boots and clothing to prevent contact.
- **Chemical suit:** May be required in certain conditions such as spills
- **Respirator**: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties.

Sr.No.	Parameter	Typical value
1.	Appearance	Colorless liquid

2.	Molecular Mass	102.09 g/mol
3.	Odor	Strong pungent, sour vinegar-like odor and lachrymatory effect
4.	Odor Threshold	0.12- 0.36 ppm
5.	pH	Not available
6.	Melting point/Freezing point	-73 deg C (-99 deg F) -74 deg C (-101 deg F)
7.	Initial Boiling point and boiling range	139.5 deg C
8.	Flash point	49 deg C (closed cup)
9.	Evaporation rate (n-BuAc=1)	0.46
10.	Flammability (Solid, gas)	Flammable Liquid
11.	Upper/lower flammability or Explosive limits	**UEL:** 10.3%v/v**; LEL:** 2.7 %v/v;
12.	Vapor pressure	0.680 kPa (5.1 mm Hg) @ 25 deg C
13.	Vapor density (air=1)	3.5
14.	Relative density	1.082 g/cu cm @ 20 deg C
15.	Solubility	83g/l at 20°C; 80g/l at 25°C slowly soluble in water. Hydrolysable.
16.	Log Pow, partition coefficient (Octonol /water)	-0.580 (estim.). Practically not applicable as it reacts.
17.	Auto-ignition temperature	316°C
18.	Decomposition temperature	Not available
19.	Viscosity	0.843 mPa.s @25 °C
20.	Explosive property	Not available
21.	Oxidizing property	Not available

9.2. Other information.

- **Surface Tension:** 31.93 mN/m @ 25 deg C; **Static charge development:** Low. Electrical conductivity is high $2.3x10^6$ ps/m @20^0C.; **Molecular Weight:** 102.09; **Corrosive material:** Yes.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

- **Reactive Groups:** Carboxylic Acids, Anhydrides (NOAA Reactivity 2007) ACETIC ANHYDRIDE reacts violently on contact with water, steam, methanol, ethanol, glycerol and boric acid. Reaction with water is particularly dangerous in presence with mineral acids (e.g., nitric, perchloric, chromic, sulfuric acid). Potentially explosive reactions with oxidizing reagents such as barium peroxide, chromium trioxide, chromic acid, hypochlorous acid, nitric acid, perchloric acid, peroxyacetic acid, potassium permanganate, hydrogen peroxide. Reacts violently with metal nitrates used as nitrating agents

10.2. Chemical stability

- Stable under normal temperature and pressure. Heat will contribute to instability.

10.3. Possibility of hazardous reactions

- Can decompose at elevated temperatures.
- Flammable. Reacts violently with water to generate acetic acid . This reaction is heightened by the presence of mineral acids (nitric, perchloric, sulfuric acid, etc.)
- Liquid is volatile and causes little irritation on uncovered skin. However, causes severe burns when clothing is wet with the chemical or if it enters gloves or shoes. Causes skin and eye burns and irritation of respiratory tract. Nausea and vomiting may develop after exposure.
- Special Hazards of Combustion Products: Irritating vapors are generated when heated. Behavior in Fire: Dangerous when exposed to heat or fire.
- Hazardous Polymerization: Not reported.

10.4. Conditions to avoid

- Keep away from heat, sparks and flame. Keep away from sources of ignition. Keep from any possible contact with water**.** Keep away from incompatible chemicals.

10.5. Incompatible materials

- **Oxidizing Materials**: (e.g. chromic trioxide, hypochlorous acid, peroxides, potassium permanganate) - can react rapidly and violently with a the risk of fire and/or explosion.
- **Strong Mineral Or Organic Acids:** (e.g. hydrochloric acid, hydrofluoric acid, perchloric acid, sulfuric acid, chlorosulfonic acid or boric acid) - reaction can be sufficiently rapid and violent to cause an explosion
- **Strong Alkalis Or Caustics**: (e.g. sodium or potassium hydroxide), or BASES
- **Water** :- reacts to form acetic acid, which may progressively lead to dangerous explosive boiling, especially in the presence of mineral acids.
- **Strong Reducing Agents** :(e.g. metal hydrides) – may react vigorously or violently.
- **Corrosivity to Metals:** Acetic anhydride is corrosive to stainless steel containing chromium. Moist or heated acetic anhydride is corrosive to cast iron, steel, and brass. Heated, dry acetic anhydride is corrosive to copper, bronze and aluminum. Dry acetic anhydride is not corrosive to types 304 and 316 stainless steels, aluminum, nickel-chromium and nickel-chromium-molybdenum alloys, tantalum and iron at normal temperatures.

10.6. Hazardous decomposition products

- Under fire conditions gives off irritating fumes and carbon monoxide.

10.7. Hazardous Polymerization: Not reported.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity

RTECS # AK1925000

No.	Parameter	Data	Reference
1	Acute Oral Toxicity	Oral Rat LD_{50}: 1780 mg/kg Effects: N.Av.	AMA Archives of Industrial Hygiene and Occupational Medicine. Vol. 4, Pg. 119, 1951.
		Oral Rat LD_{50} :630mg/kg Method: Standard acute Method	BASF (1980a)
2	Acute Skin Toxicity	Dermal Rabbit LD_{50}: 4ml/kg	Union Carbide Data Sheet. Vol.8/7/1963, (RTECS, 1987).
3	Rat (Crl:CD BR) male/female inhalation: vapour (whole body) equivalent or similar to OECD guideline 412	1670 mg/m³ air (male) for 6h. 400 ppm (2 died, 3 killed. Clinical signs indicative of respiratory irritation) LC100: 1.67 mg/L/6h (Rat) **LC50: >100ppm-<400 ppm/6h (Rat)**	HRC (1994)

a) SKIN CORROSION/IRRITATION

It causes burns and is irritating to skin

b) SERIOUS EYE DAMAGE/IRRITATION

It is irritating to eyes.
Parameter: Irritation/corrosion (Epidemiological data)
Data: Acetic anhydride is a strong irritant ...on contact with eyes, usually with delayed action; contact is followed by lacrimation, photophobia, conjunctivitis and corneal edema. Inhalation can cause nasopharyngeal and upper respiratory tract irritation, with burning sensations, cough and dyspnea; prolonged exposure may lead to pulmonary edema.

c) RESPIRATORY OR SKIN SENSITIZATION

Respiratory
Parameter: Irritation/corrosion
Data: Subchronic or Prechronic Exposure/ Rats were exposed to inhalation of vapors containing 0, 1, 5, or 20 ppm /acetic anhydride/ for 6 hr/day, 5 days per week for 13 weeks. Microscopic examination of tissue revealed signs of irritation of minimal severity in the respiratory tract (nasal passages; larynx) in most animals at the 5 ppm level. At 20 ppm, all animals showed minimal to moderate respiratory tract irritation (eye, nasal passages; larynx; trachea; lungs). Systemic effects were not observed at 5 or 20 ppm. No effects were detected at 1 ppm. In animals exposed to the same level of acetic anhydride for 13 weeks and then allowed a 13 week period without exposure, significant recovery from irritation effects were reported.

Skin Sensitization
Parameter : Skin sensitization
Data : Ambiguous results. Dermal sensitization been reported in some cases

d) GERM CELL MUTAGENICITY

Method	Result	Reference
bacterial reverse mutation assay (e.g. Ames test) (gene mutation) S. typhimurium LT-2, TA1535, TA100, C3076, TA1537, D3052, TA1538, TA98. E. coli WP2 and WP2 uvrA- (met. act.: with and without) Doses: Approximately 0.1 - 1.0, 1-10, 10-100 and 100-1000 µg/mL using concentration gradient plates. equivalent or similar to OECD Guideline 471 (Bacterial Reverse Mutation Assay)	Evaluation of results: negative with metabolic activation negative without metabolic activation Test results: negative for S. typhimurium LT-2, TA1535, TA100, C3076, TA1537, D3052, TA1538, TA98. E. coli WP2 and WP2 uvrA-(all strains/cell types tested); met. act.: with and without	McMahon RE, Cline JC and Thompson CZ (1979)

Conclusion: In the cytogenetic assays for acetic anhydride and acetic acid (chromosomal damage and sister chromatid exchange discussed above), effects were only seen at very high doses (non-physiological doses and ones exceeding the guideline limit doses for the assays) and these were due to the induced pH changes in the cell culture systems. These data indicate that were acetic anhydride to be examined in an in vitro mammalian chromosome aberration testsuch as the Chinese hamster ovary assay, it would show no genotoxic activity at standard dose levels, but similar to the cytogenetic assays and at excessively high doses, the pH of the cell culture system would be altered, and effects may be seen.

Acetic anhydride is considered to have no significant mutagenic activity in mammalian cells

e) CARCINOGENICITY
No information available

f) REPRODUCTIVE TOXICITY
Data waiving
Reason: study scientifically unjustified Justification: In accordance with Section 1 of REACH Annex XI, the study does not need to be conducted since there is a sufficient weight of evidence to conclude that there are no grounds to consider acetic anhydride as having reproductive toxicity potential in humans.

g) STOT-SINGLE EXPOSURE
No information available.

h) STOT- REPEATED EXPOSURE
No information available.

i) ASPIRATION HAZARD.
No information available.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Acetic anhydride (108-24-7)	
Toxicity to Fish	*Oncorhynchus mykiss*(Rainbow trout) ,freshwater, semi-static LC50 (96 h): > 300.82 mg/L (Reference substance-Potassium acetate solution) Method: SOP E257, equivalent or similar to OECD Guideline 203 (Fish, Acute Toxicity Test)
Toxicity to daphnia and other aquatic invertebrates	Daphnia magna, freshwater static EC50 (48 h): > 300.82 mg/L (Reference substance- Potassium acetate solution) Method: OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test),
Toxicity to aquatic plants	*Skeletonema costatum* (algae), saltwater, static EC50 (72 h): > 300.82 mg/L (Reference substance- Potassium acetate solution) Method: ISO 10253
Toxicity To bacteria	Pseudomonas putida, freshwater, static NOEC (16 h): 1150 mg/L

Based on the estimated value it is expected to be non-toxic to fish and other aquatic organisms.

12.2. Persistence and degradability

- Acetic anhydride will rapidly hydrolyse to acetic acid, which is very soluble and is likely to enter the aquatic compartment, where it will be rapidly degraded.so.Acetic anhydride is considered to be readily biodegradable.

12.3. Bio accumulative potential

Acetic anhydride (108-24-7)	
Bio concentration factor	3.16
Log Kow	-0.58

Acetic anhydride is not expected to persist in the environment because it will rapidly hydrolyse to acetic acid which is readily biodegradable, has a low potential for adsorption to organic matter and has a low potential for bioaccumulation (As the substance has a log octanol water partition coefficient less than 3).

12.4. Mobility in soil

Acetic anhydride (108-24-7)	
Koc	1.399 l/kg
Henry's Law constant	0.817 Pa/m3/mol at 25 degrees. It is volatile from aqueous bodies.
Log Kow	-0.58 (estimated). Negligible potential to bioaccumulate.

12.5. Results of PBT and vPvB assessment

- The substance does not meet the criteria for PBT or vPvB in accordance with Annex XIII.

Other adverse effects

- **Environment Fate:**
- It is not classified as dangerous to the environment. However, in presence of water it will be rapidly converted by hydrolysis to acetic acid. This will be slightly toxic to fish by virtue of the acidity. Bioaccumulation is ruled out based on the log Kow value. Based on the environmental modeling, this material has a moderate potential to get absorbed in the organic matter of soil and is volatile from water bodies. Since this is an estimated result it is recommended that the material should be disposed into the environment. The material should never be disposed into the sewage.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

- Burn in a chemical incinerator equipped with an afterb4urner and scrubber.
- Exert extra care in igniting, as this material is combustible.
- Dispose of this material in accordance with standard practice for disposal of potentially hazardous materials as required by applicable federal, state or local laws. Note that disposal regulations may also apply to empty containers and equipment reinstates.

SECTION 14: TRANSPORT INFORMATION

- It is considered to be Hazardous for Transport by Road/Rail/Sea/Air and thus regulated by ADR/RID/IMDG/IATA.

ADR/RID	IMDG	IATA
14.1. UN number		
1715	1715	1715
		
14.2. UN proper shipping name		
Acetic anhydride	ACETIC ANHYDRIDE	Acetic anhydride
14.3. Transport hazard class(es)		
Hazard class 8(Corrrosive) Sub risk, class 3(Flammable Liquid)	Hazard class 8(Corrrosive) Sub risk, class 3(Flammable Liquid)	Hazard class 8(Corrrosive) Sub risk, class 3(Flammable Liquid)
14.4. Packing group		
II	II	II
14.5. Environmental hazards		
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No
No supplementary information available		

14.6. Environmental hazards

- It is not classified as dangerous to the environment. However, in presence of water it will be rapidly converted by hydrolysis to acetic acid. This will be slightly toxic to fish by virtue of the acidity. Bioaccumulation is ruled out based on the log Kow value. Based on the environmental modeling, this material has a moderate potential to get absorbed in the organic matter of soil and is volatile from water bodies. Since this is an estimated result it is recommended that the material should be disposed into the environment. The material should never be disposed into the sewage.

14.7. Special precautions for user

- Keep away from heat/sparks/open flames/.../hot surfaces. ... No smoking.
- Keep container tightly closed.
- Ground/bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting/.../ equipment.
- Use only non-sparking tools.
- Take precautionary measures against static discharge.
- Do not breathe dust/fume/gas/mist/vapours/spray.
- Use only outdoors or in a well-ventilated area.
- Wear respiratory protection.
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Wash hands thoroughly after handling.
- Do not eat, drink or smoke when using this product.

SECTION 15: REGULATORY INFORMATION

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

European Union Information

- Acetic anhydride is not on the REACH Candidate List
- Acetic anhydride is not on the REACH Annex XIV List

National regulations

- Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
- Listed on KECI (Korean Existing Chemicals Inventory)
- Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
- Listed on NZIoC (New Zealand Inventory of Chemicals)
- Listed on the AICS (Australian Inventory of Chemical Substances)
- Listed on the Canadian DSL (Domestic Substances List)
- Listed on the Korean ECL (Existing Chemicals List)

Germany

- **VwVwS Annex reference:** Water hazard class (WGK) 1, low hazard to waters (Classification according to VwVwS, Annex 1 or 2;ID No. 3)
- **12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV:** Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

- **SZW-lijst van kankerverwekkende stoffen:** The substance is not listed
- **SZW-lijst van mutagene stoffen :** The substance is not listed
- **NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding :** The substance is not listed
- **NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid:** The substance is not listed
- **NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling:** The substance is not listed

Denmark

- **Class for fire hazard :** Class II-1
- **Store unit :** 5 liter
- **Classification remarks :** R10 <H226;H302+H330;H314>; Emergency management guidelines for the storage of flammable liquids must be followed
- **Recommendations Danish Regulation :** Young people below the age of 18 years are not allowed to use the product

US information

List of Information

Name	Cas Number	EPCRA TPQ	EPCRA RQ	CERCLA RQ	TRI	RCRA Code	CAA TQ
		Sec. 302	**Sec. 304**	**Sec. 103**	**Sec. 313**		**Sec. 112r**
Acetic anhydride	108-24-7			5,000 lbs			

- **Substances List**

US - California Permissible Exposure Limits for Chemical Contaminants
US - Connecticut Hazardous Air Pollutants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Minnesota Hazardous Substance List
US - Minnesota Permissible Exposure Limits (PELs)
US - New Jersey Right to Know Hazardous Substances
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wisconsin Hazardous Air Contaminants with Acceptable Ambient air Contaminants

CANADA REGULATORY INFORMATION

DSL: Yes
NDSL: No

SECTION 16: OTHER INFORMATION

a) Compilation information of safety data sheet

Date of Compilation : March 06, 2012

Date of Revision : January 30, 2024

Revision Number : 20

Version Number : 0028Gj Ghs20 Div.1 sds Acetic anhydride

Revision due date : December, 2026

Supersedes date : October 25, 2021

Supersedes version : 0028Gj Ghs19 Div.1 sds Acetic anhydride

b) A key or legend to aberrations and acronyms used in the safety data sheet

- **PBT :P**ersistent **B**io accumulative and **T**oxic
- **vPvB**: **V**ery **P**ersistent and **V**ery **B**io accumulative
- **SCBA**: **S**elf **C**ontained **B**reathing **A**pparatus
- **NIOSH REL**: **N**ational **I**nstitute for **O**ccupational **S**afety and **H**ealth **R**ecommended **E**xposure **L**imit
- **OSHA PEL**: **O**ccupational **S**afety and **H**ealth **A**dministration **P**ermissible **E**xposure **L**imit
- **OELTWA**: **O**ccupational **E**xposure **L**imit **T**ime Weighted **A**verages
- **IDLH**: **I**mmediately **D**angerous to **L**ife or **H**ealth
- **RTECS**: **R**egistry of **T**oxic **E**ffects of **C**hemical **S**ubstances
- **NTP**: **N**ational **T**oxicology **P**rogram
- **IARC**: **I**nternational **A**gency for **R**esearch on **C**ancer
- **EPA**: **E**nvironmental **P**rotection **A**gency
- **EPA TSCA**: **E**nvironmental **P**rotection **A**gency **T**oxic **S**ubstances **C**ontrol **A**ct
- **CERCLA**: **C**omprehensive **E**nvironmental **R**esponse, **C**ompensation, and **L**iability **A**ct
- **SARA**: **S**uperfund **A**mendments and **R**eauthorization **A**ct
- **TEC**: **T**ransport **E**mergency **C**ard
- **WHIMS**: **W**orkplace **H**azardous **M**aterials **I**nformation **S**ystem
- **DSL/NDSL**: **D**omestic/**N**on-**D**omestic **S**ubstances **L**ist
- **CSR**: **C**hemical **S**afety **R**eport
- **BCF** : **B**io **C**oncentration **F**actor
- **DNEL** : **D**erived **N**o **E**ffect **L**evel
- **PNEC** : **P**redicted **N**o **E**ffect **C**oncentration
- **TLV** : **T**hreshold **L**imit **V**alue
- **ACGIH** : **A**merican **C**onference of **G**overnmental **I**ndustrial **H**ygienists
- **REACH** : **R**egistration, **E**valuation and **A**uthorization of **C**hemicals
- **CLP** : **C**lassification, **L**abelling and **P**ackaging
- **LD / LC** : **L**ethal Dose / **L**ethal **C**oncentration
- **GHS** : **G**lobally **H**armonized **S**ystem
- **ADR** : **A**ccord European relative au transport international de merchandises
- **IMDG**-Code : **I**nternational **M**aritime Code for **D**angerous **G**oods
- **EmS** : **E**mergency **m**easures on **S**ea
- **ICAO** : **I**nternational **C**ivil **A**viation **O**rganization
- **IATA/DGR**: **I**nternational **A**ir **T**ransport **A**ssociation/**D**angerous **G**oods **R**egulations.

c) Key Literature reference and sources for data

Biographical reference and data sources

- CLP REG (regulation) (EC) no. 1272/2008, last modification by regulation (EC) no. 790/2009
- REG (EC) no. 1907/2006, last modification by REG (EC) Nr. 2015/830 [Chem. Eng. News 25, 3458].
- United Nations Environment Programme: Screening Information Data Sheets on Acetic anhydride (108-24-7) (June 1997
- Short-Term Test Program Sponsored By The Division Of Cancer Biology, National Cancer Institute, Ms. Ellen Zaika, Assistant Project Officer, P.Y85
- IUCLID dataset 20/2/2000 Olson, K.R. (ed.) Poisoning & Drug Overdose. 3rd edition. Lange Medical Books McGraw-Hill, New York, NY. 1999. p. 435
- United Nations Environment Programme: Screening Information Data Sheets on Acetic anhydride (108-24-7) (June 1997
- International Labor Office. Encyclopedia of Occupational Health and Safety. 4th edition, Volumes 1-4 1998. Geneva, Switzerland.

Internet

- RTECS

- ESIS

d) List of hazard statements

Hazard Statements	H226; H302; H330; H314 • H226: Flammable liquid and vapour. • H302: Harmful if swallowed. • H330: Fatal if inhaled. • H314: Causes severe skin burns and eye damage

SDS US (GHS HazCom2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.