SAFETY DATA SHEET

Updated on 11/12/2024

1. Material Identification

Product Name : Vinyl acetate monomer
Catalog Number : io-3193
CAS Number : 108-05-4
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

Flammable liquid (category 2)
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

Note

>> Pictograms displayed are for > 99.9% (2151 of 2152) of reports that indicate hazard statements. This chemical does not meet GHS hazard criteria for < 0.1% (1 of 2152) of reports.

Pictogram(s)

GHS Hazard Statements

>> H225 (> 99.9%): Highly Flammable liquid and vapor [Danger Flammable liquids]

>> H332 (56.2%): Harmful if inhaled [Warning Acute toxicity, inhalation]

>> H335 (56%): May cause respiratory irritation [Warning Specific target organ toxicity, single exposure; Respiratory tract irritation]

>> H351 (57.2%): Suspected of causing cancer [Warning Carcinogenicity]

>> H412 (28.3%): Harmful to aquatic life with long lasting effects [Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P203, P210, P233, P240, P241, P242, P243, P261, P271, P273, P280, P303+P361+P353, P304+P340, P317, P318, P319, P370+P378, P403+P233, P403+P235, P405, and P501

NFPA 704 Diamond

NFPA Health Rating

>> 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

NFPA Fire Rating

>> 3 - Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions.

NFPA Instability Rating

>> 2 - Materials that readily undergo violent chemical changes at elevated temperatures and pressures.

NFPA Specific Notice

>> W - No water: Materials that react violently or explosively with water.

Health Hazards:

>> Vinyl acetate has been related to reproductive abnormalities. It is a skin and upper respiratory tract irritantand a central nervous system depressant. Exposure caused gradual deterioration of heart muscles. (EPA, 1998)

ERG 2024, Guide 129P (Vinyl acetate, stabilized)

>> May cause toxic effects if inhaled or absorbed through skin.

>> Inhalation or contact with material may irritate or burn skin and eyes.

>> Fire will produce irritating, corrosive and/or toxic gases.

>> Vapors may cause dizziness or asphyxiation, especially when in closed or confined areas.

>> Runoff from fire control or dilution water may cause environmental contamination.

>> When heated to decomposition, it burns and emits acrid fumes. Highly dangerous when exposed to heat, flames or oxidizers; explosion hazard with strong acids and strong oxidizers. Incompatible with alumina, oxidizing materials, 2-aminoethanol, chlorosulfonic acid; ethyleneimine; 36% hydrochloric acid; 48.7% hydrofluoric acid; 70% nitric acid; oleum; 96% sulfuric acid; ethylene diamine; peroxides and silica gel. Avoid light or any polymerizing initiator. Hazardous polymerization can be initiated by organic and inorganic peroxides; azo compounds; redox systems (including organometallic components); light; and high energy radiation. (EPA, 1998)

ERG 2024, Guide 129P (Vinyl acetate, stabilized)

>> HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.

>> Vapors may form explosive mixtures with air.

>> Vapors may travel to source of ignition and flash back.

>> Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

>> Vapor explosion hazard indoors, outdoors or in sewers.

>> Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.

>> Runoff to sewer may create fire or explosion hazard.

>> Containers may explode when heated.

>> Many liquids will float on water.

>> Highly flammable. Vapour/air mixtures are explosive. Heating will cause rise in pressure with risk of bursting.

3. Composition/Information On Ingredients

Chemical name : Vinyl acetate monomer
CAS Number : 108-05-4
Molecular Formula : C4H6O2
Molecular Weight : 86.0900 g/mol

4. First Aid Measures

First Aid:

>> Signs and Symptoms of Acute Vinyl Acetate Monomer Exposure: Vinyl acetate monomer may irritate the skin, eyes, and respiratory tract; blisters may form. Inhalation of vapors may result in dizziness or suffocation.

>> Emergency Life-Support Procedures: Acute exposure to vinyl acetate monomer may require decontamination and life support for the victims. Emergency personnel should wear protective clothing appropriate to the type and degree of contamination. Air-purifying or supplied-air respiratory equipment should also be worn, as necessary. Rescue vehicles should carry supplies such as plastic sheeting and disposable plastic bags to assist in preventing spread of contamination.

>> Inhalation Exposure:

>> 1. Move victims to fresh air. Emergency personnel should avoid self-exposure to vinyl acetate monomer.

>> 2. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer oxygen or other respiratory support.

>> 3. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 4. Transport to a health care facility.

>> Dermal/Eye Exposure:

>> 1. Remove victims from exposure. Emergency personnel should avoid self- exposure to vinyl acetate monomer.

>> 3. Remove contaminated clothing as soon as possible.

>> 4. If eye exposure has occurred, eyes must be flushed with lukewarm water for at least 15 minutes.

>> 5. Wash exposed skin areas twice with soap and water.

>> 6. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 7. Transport to a health care facility.

>> Ingestion Exposure:

>> 1. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer oxygen or other respiratory support.

>> 2. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 3. Vomiting may be induced with syrup of Ipecac. If elapsed time since ingestion of vinyl acetate monomer is unknown or suspected to be greater than 30 minutes, do not induce vomiting and proceed to Step

>> 4.Ipecac should not be administered to children under 6 months of age.Warning: Syrup of Ipecac should be administered only if victims are alert, have an active gag-reflex, and show no signs of impending seizure or coma. If ANY uncertainty exists, proceed to Step

>> 4.The following dosages of Ipecac are recommended: children up to 1 year old, 10 mL (1/3 oz); children 1 to 12 years old, 15 mL (1/2 oz); adults, 30 mL (1 oz). Ambulate (walk) the victims and give large quantities of water. If vomiting has not occurred after 15 minutes, Ipecac may be readministered. Continue to ambulate and give water to the victims. If vomiting has not occurred within 15 minutes after second administration of Ipecac, administer activated charcoal.

>> 4. Activated charcoal may be administered if victims are conscious and alert. Use 15 to 30 g (1/2 to 1 oz) for children, 50 to 100 g (1-3/4 to 3-1/2 oz) for adults, with 125 to 250 mL (1/2 to 1 cup) of water.

>> 5. Promote excretion by administering a saline cathartic or sorbitol to conscious and alert victims. Children require 15 to 30 g (1/2 to 1 oz) of cathartic; 50 to 100 g (1-3/4 to 3-1/2 oz) is recommended for adults.

>> 6. Transport to a health care facility. (EPA, 1998)

ERG 2024, Guide 129P (Vinyl acetate, stabilized)

>> General First Aid:

>> Call 911 or emergency medical service.

>> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

>> Move victim to fresh air if it can be done safely.

>> Administer oxygen if breathing is difficult.

>> If victim is not breathing:

>> DO NOT perform mouth-to-mouth resuscitation; the victim may have ingestedor inhaled the substance.

>> If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).

>> If no pulse detected or no respiratory medical device available, provide continuouscompressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.

>> Remove and isolate contaminated clothing and shoes.

>> For minor skin contact, avoid spreading material on unaffected skin.

>> In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.

>> For severe burns, immediate medical attention is required.

>> Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

>> Keep victim calm and warm.

>> Keep victim under observation.

>> For further assistance, contact your local Poison Control Center.

>> Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.

>> Specific First Aid:

>> Wash skin with soap and water.

>> In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.

>> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

First Aid Measures

Inhalation First Aid

>> Fresh air, rest. Half-upright position. Refer for medical attention.

Skin First Aid

>> Remove contaminated clothes. Rinse skin with plenty of water or shower. Seek medical attention if you feel unwell.

Eye First Aid

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Ingestion First Aid

>> Rinse mouth. Give one or two glasses of water to drink. Refer for medical attention .

5. Fire Fighting Measures

>> Vapors are heavier than air and may travel to a source of ignition and flash back.

>> Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing. Spray cooling water on containers that are exposed to flames until well after the fire is out. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. Isolate for 1/2 mile in all directions if tank car or truck is involved in fire. Small fires: extinguish with dry chemical, carbon dioxide, water spray, fog, or alcohol foam. Large fires: water spray, fog, or alcohol foam. (EPA, 1998)

>> Use alcohol-resistant foam, foam, powder, carbon dioxide, fine water spray. In case of fire: keep drums, etc., cool by spraying with water.

6. Accidental Release Measures

Isolation and Evacuation:

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 129 [Flammable Liquids (Water-Miscible / Noxious); polymerization hazard]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

>> LARGE SPILL: Consider initial downwind evacuation for at least 300 meters (1000 feet).

>> FIRE: If tank, rail tank car or highway tank 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. (ERG, 2024)

Evacuation: ERG 2024, Guide 129P (Vinyl acetate, stabilized)

>> Immediate precautionary measure

>> Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

>> Large Spill

>> Consider initial downwind evacuation for at least 300 meters (1000 feet).

>> Fire

>> If tank, rail tank car or highway tank 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.

Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Accidental Release Measures

Public Safety: ERG 2024, Guide 129P (Vinyl acetate, stabilized)

>> CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.

>> Keep unauthorized personnel away.

>> Stay upwind, uphill and/or upstream.

>> Ventilate closed spaces before entering, but only if properly trained and equipped.

Spill or Leak: ERG 2024, Guide 129P (Vinyl acetate, stabilized)

>> ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.

>> All equipment used when handling the product must be grounded.

>> Do not touch or walk through spilled material.

>> Stop leak if you can do it without risk.

>> Prevent entry into waterways, sewers, basements or confined areas.

>> A vapor-suppressing foam may be used to reduce vapors.

>> Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

>> Use clean, non-sparking tools to collect absorbed material.

>> Large Spill

>> Dike far ahead of liquid spill for later disposal.

>> Water spray may reduce vapor, but may not prevent ignition in closed spaces.

7. Handling And Storage

Safe Storage:

>> Fireproof. Separated from strong oxidants, acids and bases. Keep in the dark. Well closed. Store only if stabilized. Store in an area without drain or sewer access.

Storage Conditions:

>> It can be stored in steel, aluminum, or stainless steel containers under nitrogen. It is not necessary to add stabilizers at lower temperatures. If the vinyl acetate is to be warmed, stabilizers, such as hydroquinone, hydroquinone monomethyl ether, or diphenylamine are added. The quantity of stabilizer used is small, e.g., 3 -20 ppm hydroquinone, so that it does not generally need to be removed during the later polymerization.

8. Exposure Control/ Personal Protection

REL-C (Ceiling)

>> 4 ppm (15 mg/m³), [15 minutes]

>> C 4 ppm (15 mg/m3) [15-minute]

>> none See Appendix G

>> 10.0 [ppm]

TLV-STEL

>> 15.0 [ppm]

>> 10 ppm as TWA; 15 ppm as STEL; A3 (confirmed animal carcinogen with unknown relevance to humans).

TLV-TWA (Time Weighted Average)

>> 10 ppm [1992]

TLV-STEL (Short Term Exposure Limit)

>> 15 ppm [1992]

EU-OEL

>> 17.6 mg/m

MAK (Maximale Arbeitsplatz Konzentration)

>> 36 mg/m

Emergency Response: ERG 2024, Guide 129P (Vinyl acetate, stabilized)

>> CAUTION: The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.

>> Small Fire

>> Dry chemical, CO2, water spray or alcohol-resistant foam.

>> Do not use dry chemical extinguishers to control fires involving nitromethane (UN1261) or nitroethane (UN2842).

>> Large Fire

>> Water spray, fog or alcohol-resistant foam.

>> Avoid aiming straight or solid streams directly onto the product.

>> If it can be done safely, move undamaged containers away from the area around the fire.

>> Fire Involving Tanks, Rail Tank Cars or Highway Tanks

>> Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.

>> Cool containers with flooding quantities of water until well after fire is out.

>> Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

>> ALWAYS stay away from tanks in direct contact with flames.

>> For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

>> ERPG-1: 5 ppm - one hour exposure limit: 1 = mild transient health effects or objectionable odor [AIHA]

>> ERPG-2: 75 ppm - one hour exposure limit: 2 = impaired ability to take protective action [AIHA]

>> ERPG-3: 500 ppm - one hour exposure limit: 3 = life threatening health effects [AIHA]

Inhalation Risk:

>> A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20 °C.

Effects of Short Term Exposure:

>> The substance is irritating to the respiratory tract. The substance is mildly irritating to the eyes and skin.

Effects of Long Term Exposure:

>> Repeated or prolonged contact with skin may cause dryness and cracking. This substance is possibly carcinogenic to humans.

Fire Prevention

>> NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.

Exposure Prevention

>> AVOID ALL CONTACT!

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Protective gloves.

Eye Prevention

>> Wear safety goggles or eye protection in combination with breathing protection.

Ingestion Prevention

>> Do not eat, drink, or smoke during work.

Exposure Control and Personal Protection

Protective Clothing: ERG 2024, Guide 129P (Vinyl acetate, stabilized)

>> Wear positive pressure self-contained breathing apparatus (SCBA).

>> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

9. Physical And Chemical Properties

Molecular Weight:

>> 86.09

Exact Mass:

>> 86.036779430

Physical Description:

>> Vinyl acetate appears as a clear colorless liquid. Flash point 18 °F. Density 7.8 lb / gal. Slightly soluble in water. Vapors are heavier than air. Vapors irritate the eyes and respiratory system. May polymerize if heated or contaminated. If polymerization occurs inside a container, the container may violently rupture. Used to make adhesives, paints, and plastics.

>> COLOURLESS LIQUID WITH CHARACTERISTIC ODOUR.

Color/Form:

>> COLORLESS, MOBILE LIQUID

Odor:

>> An initially pleasant odor which quickly becomes sharp and irritating ... Not unpleasant , sweetish smell in small quantities

Boiling Point:

>> 162 to 163 °F at 760 mmHg (EPA, 1998)

>> 72.7 °C

Melting Point:

>> -136 °F (EPA, 1998)

>> -93.2 °C

Flash Point:

>> 18 °F (EPA, 1998)

>> -8 °C c.c.

Solubility:

>> 2 % (NIOSH, 2024)

>> Solubility in water, g/100ml at 20 °C: 2 (poor)

Density:

>> 0.932 at 68 °F (EPA, 1998) - Less dense than water; will float

>> Relative density (water = 1): 0.93

Vapor Density:

>> 3 (EPA, 1998) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 3.0

Vapor Pressure:

>> 83 to 140 mmHg at 68 to 86 °F (EPA, 1998)

>> Vapor pressure, kPa at 20 °C: 11.7

LogP:

>> log Kow = 0.73

>> 0.73

Stability/Shelf Life:

>> ... Polymerizes in light ...

Autoignition Temperature:

>> 756 °F (USCG, 1999)

>> 385 °C

Decomposition:

>> WHEN HEATED TO DECOMP, BURNS & EMITS FUMES WITH AN ACRID ODOR.

Viscosity:

>> 0.43 cPs at 20 °C

Heat of Combustion:

>> -9754 BTU/lb = -5419 cal/g = -226.9X10+5 J/kg

Heat of Vaporization:

>> 163 BTU/lb = 90.6 cal/g = 3.79X10+5 J/kg

Surface Tension:

>> 23.95 DYNES/CM= 0.02395 N/M @ 20 °C

Ionization Potential:

>> 9.19 eV

Polymerization:

Polymerization is a process of reacting monomer molecules together in a chemical reaction to form polymer chains or three-dimensional networks.

>> ... TOO LOW A LEVEL OF INHIBITOR & WARM, MOIST STORAGE CONDITIONS MAY LEAD TO SPONTANEOUS POLYMERIZATION. THIS PROCESS INVOLVES AUTOOXIDATION OF ACETALDEHYDE ... TO PEROXIDE, WHICH INITIATES EXOTHERMIC POLYMERIZATION AS IT DCMP. ... OTHER PEROXIDES OR RADICAL SOURCES WILL INITIATE EXOTHERMIC POLYMERIZATION.

Odor Threshold:

>> Odor Threshold Low: 0.36 [mmHg]

>> Odor Threshold High: 0.5 [mmHg]

>> Reported odor thresholds

Refractive Index:

>> Index of refraction: 1.3926 at 25 °C

Relative Evaporation Rate:

The rate at which a material will vaporize (evaporate, change from liquid to vapor), compared to the rate of vaporization of a specific known material.

>> 8.9 (n-Butyl acetate = 1)

Collision Cross Section:

Collision cross section (CCS) represents the effective area for the interaction between an individual ion and the neutral gas through which it is traveling (e.g., in ion mobility spectrometry (IMS) experiments). It quantifies the probability of a collision taking place between two or more particles.

>> 227.2 Å² [M+H]+ [CCS Type: DT; Method: stepped-field]

10. Stability And Reactivity

>> Highly flammable. Slightly soluble in water.

>> Highly Flammable

>> Polymerizable

>> Strong Reducing Agent

>> Peroxidizable Compound

Peroxide Forming Chemical:

Peroxide-forming chemicals (PFCs) are chemicals that can "auto-oxidize" with atmospheric oxygen under ambient conditions to form organic peroxides (contains an -O-O- bond). Peroxide formation can be initiated by exposure to air, self-polymerization, or solvent impurities. Once formed, organic peroxides are sensitive to thermal or mechanical shock and can be violently explosive in concentrated solutions or as solids.

Chemical

>> Vinyl acetate

Class (* = UMN Designation)

>> C: Compounds that autopolymerize due to peroxide formation if inhibitors are depleated or not present

Peroxide Concentration Over Time

>> 1 sample had 0 ppm peroxide; age 3 yrs

Reference(s)

>> Kelly

Incident Involved

>> Susceptible to polymerization and several explosions in industrial settings have been recorded. See Bretherick's.

Additional Reference(s)

>> Harmon, 1974, 2.19

>> Levy, L. B., Process Safety Progress, 1993,12(1), 47

>> Gustin, J. L. et al., Chem. Abs., 1998, 129, 264630g

>> Copelli, S. et al., J. Haz. Mat., 2011, 192(1), 8

>> Barnes, C. E. et al., J. Amer. Chem. Soc., 1950, 72, 210

>> Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 3672

>> https://toxnet.nlm.nih.gov/cgi-bin/sis/search2/r?dbs+hsdb:@term+@rn+@rel+108-05-4

11. Toxicological Information

Toxicity Summary:

>> Polyvinyl acetate usually contains trace amounts of its precursor, vinyl acetate. One of the metabolites of vinyl acetate, acetaldehyde, is a known animal carcinogen. Acetaldehyde can form adducts with DNA, causing damage such as cross-links. (L1304, A354)

RAIS Toxicity Values:

This section provides the Chemical toxicity information from the Risk Assessment Information System.

Inhalation Acute Reference Concentration (RfCa) (mg/m^3)

>> 3.52

Inhalation Acute Reference Concentration Reference

>> ATSDR Draft

Inhalation Chronic Reference Concentration (RfC) (mg/m^3)

>> 0.2

Inhalation Chronic Reference Concentration Reference

>> IRIS Current

Inhalation Subchronic Reference Concentration (RfCs) (mg/m^3)

>> 2.46

Inhalation Subchronic Reference Concentration Reference

>> ATSDR Draft

Inhalation Short-term Reference Concentration (RfCt) (mg/m^3)

>> 2.46

Inhalation Short-term Reference Concentration Reference

>> ATSDR Draft

Oral Chronic Reference Dose (RfDoc) (mg/kg-day)

>> 1

Oral Chronic Reference Dose Reference

>> HEAST Current

Oral Subchronic Chronic Reference Dose (RfDos) (mg/kg-day)

>> 1

Oral Subchronic Chronic Reference Dose Reference

>> HEAST Current

USGS Health-Based Screening Levels for Evaluating Water-Quality:

This section provides the USGS Health-Based Screening Levels for Evaluating Water-Quality data.

Chemical

>> Acetate, Vinyl

Reference

>> Smith, C.D. and Nowell, L.H., 2024. Health-Based Screening Levels for evaluating water-quality data (3rd ed.). DOI:10.5066/F71C1TWP

Evidence for Carcinogenicity:

Evidence that this chemical does or may cause cancer. The information here is collected from various sources by the Hazardous Substances Data Bank (HSDB).

>> Evaluation: There is inadequate evidence in humans for the carcinogenicity of vinyl acetate. There is limited evidence in experimental animals for the carcinogenicity of vinyl acetate. Overall evaluation: Vinyl acetate is possibly carcinogenic to humans (Group 2B). In making the overall evaluation, the working group took into account the following evidence: (1) Vinyl acetate is rapidly transformed into acetaldehyde in human blood and animal tissues. (2) There is sufficient evidence in experimental animals for the carcinogenicity of acetaldehyde. Both vinyl acetate and acetaldehyde induce nasal cancer in rats after administration by inhalation. (3) Vinyl acetate and acetaldehyde are genotoxic in human cells in vitro and on animals in vivo.

Carcinogen Classification:

This section provides the International Agency for Research on Cancer (IARC) Carcinogenic Classification and related monograph links. In the IARC Carcinogenic classification, chemicals are categorized into four groups: Group 1 (carcinogenic to humans), Group 2A (probably carcinogenic to humans), Group 2B (possibly carcinogenic to humans), and Group 3 (not classifiable as to its carcinogenicity to humans).

IARC Carcinogenic Agent

>> Vinyl acetate

IARC Carcinogenic Classes

>> Group 2B: Possibly carcinogenic to humans

IARC Monographs

>> Volume Sup 7: Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42, 1987; 440 pages; ISBN 92-832-1411-0 (out of print)

>> Volume 63: (1995) Dry Cleaning, Some Chlorinated Solvents and Other Industrial Chemicals

>> 3, not classifiable as to its carcinogenicity to humans. (L135)

Health Effects:

>> Vinyl acetate may affect the immune system. It may also be a carcinogen. (L1304)

Exposure Routes:

>> The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

>> inhalation, ingestion, skin and/or eye contact

Inhalation Exposure

>> Sore throat. Cough. Shortness of breath.

Skin Exposure

>> Redness. Dry skin.

Eye Exposure

>> Redness.

>> irritation eyes, skin, nose, throat; hoarseness, cough; loss of smell; eye burns, skin blisters

Target Organs:

Organs that are affected by exposure to this chemical. Information in this section reflects human data unless otherwise noted.

>> Respiratory (From the Nose to the Lungs)

>> Nervous

>> Respiratory

Adverse Effects:

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Neurotoxin - Acute solvent syndrome

>> Occupational hepatotoxin - Secondary hepatotoxins: the potential for toxic effect in the occupational setting is based on cases of poisoning by human ingestion or animal experimentation.

>> Dermatotoxin - Skin burns.

>> Lacrimator (Lachrymator) - A substance that irritates the eyes and induces the flow of tears.

>> IARC Carcinogen - Class 3: Chemicals are not classifiable by the International Agency for Research on Cancer.

>> ACGIH Carcinogen - Confirmed Animal.

Toxicity Data:

>> LC50 (rat) = 3680 ppm/4h

Minimum Risk Level:

The minimal risk level (MRL) is an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health

>> Intermediate Inhalation: 0.01 ppm (L134)

Interactions:

>> ... Previous studies from our laboratory suggest that rat liver microsome-activated vinyl acetate induces plasmid DNA-histone crosslinks, in vitro, through esterase-mediated metabolism. Since nasal tissues contain high levels of carboxylesterase, tumorigenesis may be related to in situ production of the hydrolysis products acetaldehyde and acetic acid. Vinyl acetate was cytotoxic to both respiratory and olfactory tissues in vitro at 50-200 mM, but not 25 mM, after 2 hr exposure. Pretreatment of rats with the carboxylesterase inhibitor, bis-(p-nitrophenyl) phosphate (BNPP), attenuated the cytotoxic effects and metabolism of vinyl acetate in both tissue types. Semicarbazide, an aldehyde

scavenger, was unable to protect the tissues from vinyl acetate-induced cytotoxicity. When the metabolites were tested, acetic acid, but not acetaldehyde, was cytotoxic to both tissues.

Antidote and Emergency Treatment:

>> Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Esters and related compounds/

Human Toxicity Excerpts:

>> /HUMAN EXPOSURE STUDIES/ To provide validation data for the application of the PBPK model ... in humans, controlled human exposures to inhaled vinyl acetate were conducted. Air was sampled by a probe inserted into the nasopharyngeal cavity of five volunteers (two women, three men). Volunteers were instructed to inhale and exhale through the nose. Sampling was carried out during exposure to labeled 13C1, 13C2-vinyl acetate during resting and light exercise at three exposure levels (1, 5 and 10 ppm nominally). Both, labeled vinyl acetate and the major metabolite acetaldehyde from the nasopharyngeal region were sampled at a calibrated flow rate of 12 L/hr and analyzed in real time utilizing ion trap mass spectrometry (MS/MS). Measurements were taken every 0.8 sec in an exposure period of 2 to 5 min resulting in data during all phases of the breathing. The rate of sampling was rapid enough to capture much of the behavior of vinyl acetate in the human nasal cavity including inhalation and exhalation. However, the sampling was not frequent enough to accurately capture the peak concentration in every breath ...

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Mild irritation after 5-15 minutes of exposure and necrosis after 20 hours of exposure was demonstrated in a further skin irritation study: An unknown number of rabbits were dermally exposed to unknown amounts of undiluted vinyl acetate for 1, 5 and 15 minutes and for 20 hours ... . No signs of irritation were observed after 24 hours following 1-minute exposure; slight erythema occurred 24 hours after the 5- and the 15-minutes exposures. Mild erythema and mild edema were observed at 24 hr after the 20-hours exposure. Necrosis was observed 8 days after 20 hour-exposure to the compound.

Non-Human Toxicity Values:

>> LC50 Rat inhalation 3680 ppm/4 hr

TSCA Test Submissions:

Under the Toxic Substances Control Act (TSCA), EPA has broad authority to issue regulations designed to require manufacturers (including importers) or processors to test chemical substances and mixtures for health and environmental effects. This section provides information on test reports submitted for this chemical under TSCA.

>> Teratogenicity was evaluated in mated female Sprague Dawley rats (23/group) orally exposed to vinyl acetate in their drinking water at concentrations of 0, 200, 1000 or 5000 ppm on gestation days (GD) 6-15. There was a significant difference observed between treated and control animals in increased mean pregnancy rates (high-dose group). There were no significant differences observed between treated and control animals in the following: maternal mortality, body weight, body weight gain and food intake, mean pregnancy rates, numbers of corpora lutea/dam and fetal sex ratio, pre- or post-implantation losses, macroscopic fetal changes, mean litter weight and fetal weight, external/visceral and skeletal defects and crown rump length.

Populations at Special Risk:

>> Applicants or employees found during examinations to have medical conditions that could be directly or indirectly aggravated by exposure to vinyl acetate, eg, chronic irritation of the respiratory tract, chronic inflammatory conditions of the skin, or chronic eye irritation, shall be counseled on the increased risk of impairment of their health from working with the compound.

12. Ecological Information

Resident Soil (mg/kg)

>> 2.10e+01

Industrial Soil (mg/kg)

>> 9.60e+01

Tapwater (ug/L)

>> 2.50e+00

MCL (ug/L)

>> 5.00e+01

Risk-based SSL (mg/kg)

>> 1.50e-02

Oral Slope Factor (mg/kg-day)-1

>> 3.00e-02

Chronic Oral Reference Dose (mg/kg-day)

>> 5.00e-04

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Fraction of Contaminant Absorbed Dermally from Soil

>> 0.032

Resident Air (ug/m3)

>> 2.10e+02

Industrial Air (ug/m3)

>> 8.80e+02

Chronic Inhalation Reference Concentration (mg/m3)

>> 2.00e-01

Soil Saturation Concentration (mg/kg)

>> 2.75e+03

ICSC Environmental Data:

>> The substance is harmful to aquatic organisms.

13. Disposal Considerations

Spillage Disposal

>> Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Disposal Methods

>> SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational exposure or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal, aquatic, and plant life; and conformance with environmental and public health regulations.

>> The following wastewater treatment technologies have been investigated for vinyl acetate: Concentration process: Activated Carbon.

>> Do not empty into drains.

>> Vinyl acetate is a waste chemical stream constituent which may be subjected to ultimate disposal by controlled incineration.

>> For more Disposal Methods (Complete) data for VINYL ACETATE (9 total), please visit the HSDB record page.

14. Transport Information

DOT

Vinyl acetate monomer
3
UN Pack Group: II
Reportable Quantity of 5000 lb or 2270 kg

IATA

Vinyl acetate monomer
3,
UN Pack Group: II

15. Regulatory Information

DHS Chemicals of Interest (COI):

This section provides the Department of Homeland Security (DHS) Chemicals of Interest (COI) and related information (Ref: 6 eCFR part 27 - https://www.ecfr.gov/current/title-6/chapter-I/part-27).

Chemicals of Interest(COI)

>> Vinyl acetate monomer

Release: Minimum Concentration (%)

>> 1

Release: Screening Threshold Quantities (in pounds)

>> 10000

Security Issue: Release - Flammables

>> Flammable chemical that can be released at a facility.

Clean Water Act Requirements:

The Clean Water Act (CWA) of 1972 establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under CWA, the U.S. Environmental Protection Agency (EPA) developed the Toxic Pollutant List (40 CFR Part 401.15) and the Priority Pollutant List (40 CFR Part 423, Appendix A). These lists are to be used by EPA and States to develop the Effluent Guidelines regulations and ensure water quality criteria and standards.

>> Vinyl acetate is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

TSCA Requirements:

This section provides information on requirements concerning this chemical under the Toxic Substances Control Act (TSCA) of 1976. TSCA provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics and pesticides.

>> Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. Vinyl acetate is included on this list. Effective date 2/10/86; Sunset date: 2/10/96.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Acetic acid, ethenyl ester

California Safe Cosmetics Program (CSCP) Reportable Ingredient

>> Hazard Traits - Carcinogenicity; Respiratory Toxicity

>> Authoritative List - CA TACs; IARC Carcinogens - 2B; OEHHA RELs

>> Report - regardless of intended function of ingredient in the product

REACH Registered Substance

>> Status: Active Update: 11-05-2023 https://echa.europa.eu/registration-dossier/-/registered-dossier/15530

New Zealand EPA Inventory of Chemical Status

>> Acetic acid ethenyl ester: HSNO Approval: HSR001235 Approved with controls

16. Other Information

Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> Combustion may produce irritants and toxic gases.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Acetic acid, ethenyl ester: Human health tier II assessment

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."