Material Safety Data Sheet

Product identifier	Vinyl acetate monomer

1. Identification of the substance/mixture and of the company/undertaking

1) Product identifier: 99.9% Vinyl acetate monomer

2) Relevant identified uses of the substance or mixture and uses advised against

- Relevant identified uses: No data
- Uses advised against: No data

3) Manufacturer information(For imports, emergency number)

- Company: LOTTE INEOS CHEMICAL Co., Ltd.
- Address: 63-15, Sanggae-ro, Sangnam-ri, Cheongnyang-eub, Ulju-gun, Ulsan, Republic of Korea
- Emergency telephone number: +82-52-279-1190~6

2. HAZARD IDENTIFICATION

1) Hazard classification

- Flammable liquid : Cat. 2
- Acute toxicity(inhalation: vapor) : Cat. 4
- Severe eye damage/Eye irritation : Cat. 2
- Skin sensitization : Cat. 1
- Carcinogenicity : Cat. 2
- Specific target organ toxicity(single exposure) : Cat. 3(respiratory irritation)
- Specific target organ toxicity(repeated exposure) : Cat. 2

2) Allocation label elements

Hazard pictograms

Signal word: Danger

Hazard statements

- H225 Highly flammable liquid and vapour.
- H317 May cause an allergic skin reaction.
- H319 Causes serious eye irritation.
- H332 Harmful if inhaled.
- H335 May cause respiratory irritation.
- H351 Suspected of causing cancer
- H373 May cause damage to body through prolonged or repeated exposure.

Precautionary statements

Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- 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/lighting equipment.
- P242 Use only non-sparking tools.
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 Wash handling area thoroughly after handling.
- P271 Use only outdoors or in a well-ventilated area.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

- P302+P352 IF ON SKIN: Wash with plenty of soap and water.
- P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308+P313 IF exposed or concerned: Get medical advice/attention.
- P312 Call a POISON CENTER or doctor/physician if you feel unwell.
- P314 Get medical advice/attention if you feel unwell.
- P321 Specific treatment such as washing with water, preventing not to spread on skin.

	P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
	P337+P313 If eye irritation persists: Get medical advice/attention.
	P362+P364 Take off contaminated clothing and wash before reuse.
	P370+P378 In case of fire: Use alcohol foam, carbon dioxide, or water spray for extinction.
Storage	P403+P233 Store in a well-ventilated place. Keep container tightly closed.
	P403+P235 Store in a well-ventilated place. Keep cool.
	P405 Store locked up.
Disposal	P501 Dispose of contents/container according to applicable regulations.
3) Other Hazard·Risk which are not included in the classification criterias(NFPA)	
Health	2
Flammability	3
Reactivity	2

3. Composition/Information on ingredients

Chemical Name	Vinyl acetate
Other name	Vinyl acetate ester
CAS No.	108-05-4
PCT (WT)(%)	99.9
Chemical Name	WATER
Other name	Hydrogen oxide
CAS No.	7732-18-5
PCT (WT)(%)	0.1

4. FIRST AID MEASURES

1) Following eye contact	IF IN EYES: Rinse cautiously with water for several minutes.
	Remove contact lenses, if present and easy to do. Continue rinsing.
2) Following skin contact	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
	If skin irritation or rash occurs: Get medical advice/attention.
	Wash contaminated clothing before reuse.
	Remove contaminated clothing, shoes and isolate contaminated area.
	For minor skin contact, avoid spreading material on unaffected skin.
	In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
3) Following inhalation	If exposed or concerned: Get medical advice/attention.
	If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.
4) Following ingestion	If exposed or concerned: Get medical advice/attention.
	Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
5) Advice to physician	When exposed, take an immediate action such as contacting the medical team and conducting a follow-up studies. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. FIRE FIGHTING MEASURES

1) Suitable (and unsuitable) extinguishing media	Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
	Use dry sand or earth to smother fire.
2) Special hazards arising from the substance or mixture	Highly flammable liquids, vapors
	May violently polymerize and result in fire and explosion.
	Vapors can travel to a source of ignition and flash back.
	Pungent and toxic gas can be formed by thermal decomposition and combustion while burning.
	Can form explosive mixtures at temperatures at or above the flashpoint.
	Containers may explode when heated.
	Highly flammable: Will be easily ignited by heat, sparks or flames.
	Runoff may create fire or explosion hazard.
	Vapor explosion hazard indoors, outdoors or in sewers.
	Some may burn but not ignite readily.

	Vapors may form explosive mixtures with air.
	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
3) Special protective equipment for firefighters	Rescuers must use appropriate protective equipment.
	Evacuate area and fight fire from a safe distance.
	Cautions ; Most of liquids are lighter than water
	Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
	Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
	Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
	Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
	Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.
	Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
6. ACCIDENTAL RELEASE MEASURES	
1) Health considerations and protective equipment	Avoid breathing dust/fume/gas/mist/vapours/spray.
	The very fine particles can cause a fire or explosion, eliminate all ignition sources.
	Clean up spills immediately, observing precautions in Protective Equipment section.
	Remove all ignition source.
	All equipment used when handling the product must be grounded.
	Stop leak if you can do it without risk.
	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
	A vapor suppressing foam may be used to reduce vapors.
	Cover with plastic sheet to prevent spreading.
	Please note that materials and conditions to be avoided.
2) Environmental precautions	Prevent the inflow to the canal, drain, basement, and closed-door.
3) For cleaning up	Dike and collect water used to fight fire.
	Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
	Reduce airborne dust and prevent scattering by moistening with water.
	Absorb with liquid, wash spill area with detergent and water.
	When leaks substantially, make a ditch far away from the liquid leakage
	Use clean explosion proof tools to collect absorbed material.
7. HANDLING AND STORAGE	
1) Precautions for safe handling	Do not handle until all safety precautions have been read and understood.
	Use explosion-proof electrical/ventilating/lighting equipment.
	Use only non-sparking tools.
	Take precautionary measures against static discharge.
	Avoid breathing dust/fume/gas/mist/vapours/spray.
	Wash handling area thoroughly after handling.
	Use only outdoors or in a well-ventilated area.
	Contaminated work clothing should not be allowed out of the workplace.
	Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition.
	Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
	Use care in handling/storage.
	Loosen closure cautiously before opening.
	Avoid prolonged or repeated contact with skin.
	All equipment used when handling the product must be grounded.
	Please note that materials and conditions to be avoided.
	Caution: Heat
	Measure atmospheric oxygen concentration and ventilate the area during the operation since low-closed area can cause oxygen deficiency.
2) Conditions for safe storage	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
	Keep container tightly closed.
	Store in a well-ventilated place. Keep cool.
	Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.

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8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Chemical exposure limits, Biological exposure standard	
Occupational exposure limits (Domestic)	TWA - 10ppm STEL - 15ppm
Occupational exposure limits (ACGIH)	TWA - 10ppm STEL - 15ppm
Biological limit values	No data
2) Appropriate engineering controls	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. When dust, fume or mist generates during operation, ventilate to maintain the air pollution below exposure limit. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
3) Personal protection equipment	
Respiratory protection	Wear breathing protection, which needs a confirmation from the Korea Occupational Safety and Health Agency. Wear proper filtered, canister-mounted full-face, electric half-face or air supplied continuous flow/pressure required half-face respiratory protection when exposure concentration less than 500ppm. Wear proper filtered or canister-mounted full-face or hood/helmet type, pressure required air supplied respirator when exposure concentration less than 10000ppm. Wear proper filtered, canister-mounted Self-Contained Breathing Apparatus(SCBA) or pressure required SCBA respiratory protection when exposure concentration less than 100000ppm. Wear breathing protection, which needs a confirmation from the Korea Occupational Safety and Health Agency, for exposed gas/liquid by the physio-chemical properties Wear proper filtered or canister-mounted half-face respiratory protection when exposure concentration less than 100ppm. Wear proper filtered or canister-mounted loose-fitting electric hood/helmet respiratory protection, or continuous flow dust mask when exposure concentration less than 250ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

1) Appearance	
Physical state	Fluid-liquid
Colour	Colorless
2) Odor	Sweat, pungent smell(2)
3) Odor threshold	No data
4) pH	No data
5) Melting point/freezing point	-93℃
6) Initial boiling point and boiling range	72 ℃
7) Flash point	-8 ℃ (c.c.)
8) Evaporation rate	8.9
9) Flammability(solid, gas)	Flammable (1)
10) Upper/lower flammability or explosive limits	13.4 / 2.6 %
11) Vapour pressure	11.7 ㎪ (20℃)
12) Solubility(ies)	2.5 g/100㎖ (20℃ (1), Soluble in Ethane, Ether, Acetone, Benzene, Chloroform, Organic solvent (2))
13) Vapour density	3
14) Relative density	0.9
15) n-octanol/water partition coefficient	0.73
16) Auto ignition temperature	402 ℃
17) Decomposition temperature	No data
18) Viscosity	0.43 cP (20℃)
19) Molecular weight(mass)	86.09
20) Other information	Self-Acelerated Polymerization Temperature (SAPT): >65 ℃ No self-heating was observed as a result of a seven-day test of 65°C in accordance with UN TDG Test Method(Part II Section 28.4.4 H.4)

10. STABILITY AND REACTIVITY

1) Stability and hazardous reactivity	Highly flammable liquids, vapors May violently polymerize and result in fire and explosion. Can form explosive mixtures at temperatures at or above the flashpoint. Containers may explode when heated. HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames. Runoff may create fire or explosion hazard. Vapor explosion hazard indoors, outdoors or in sewers. Vapors may form explosive mixtures with air.

	Vapors may travel to source of ignition and flash back.
	May cause toxic effects if inhaled or absorbed through skin.
	Stable under normal temperatures and pressures.
	Containers may explode when heated.
2) Conditions to avoid	Keep away from heat/sparks/open flames/hot surfaces. - No smoking
3) Incompatible materials	No data
4) Hazardous decomposition products	During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

11. TOXICOLOGICAL INFORMATION

1) Information on the likely routes of exposure	No data
2) Health hazard information	
Acute toxicity	
Oral	LD50 2900 ㎎/㎏ Rat
Dermal	LD50 2335 ㎎/㎏ Rabbit
Inhalation	LC50 11.4 ㎎/ℓ 4 hr Rat
Skin corrosion/Irritation	Slight irritation result in skin irritation test of rabbit.
Serious eye damage/irritation	Strong irritation result in eye irritation test of rabbit.
Respiratory sensitization	No data
Skin sensitization	Positive, result in guinea pig.
Carcinogenicity	
Ministry of Employment and Labor Notice	2
IARC	Group 2B
OSHA	Present
ACGIH	A3
NTP	No data
EU CLP	2
Germ cell mutagenicity	Negative in reproductive cell micronucleus test, Positive in somatic cell micronucleus test, Positive in somatic cell chromosomal aberration test.
Reproductive toxicity	There is no significant toxicity in teratogenicity test and reproductive toxicity test of white rat and mouse.
Specific target organ toxicity (single exposure)	Respiratory irritation, result in human.
Specific target organ toxicity (repeated exposure)	Upper respiratory tract inflammation was observed in human. Pneumonia and rhinitis, post nasal epidermal atrophy, mucous gland atrophy, epidermal growth and atrophy of epidermis after nasal passage, hyperplasia of basal cell were observed in test animals.
Aspiration hazard	No data

12. ECOLOGICAL INFORMATION

1) Aquatic toxicity	
Fish	LC50 2.39 ㎎/ℓ 96 hr
Crustacean	No data
Acuatic algae	EC50 9.5 ㎎/ℓ 48 hr
2) Persistence and degradation	
Persistence	log Kow 0.73
Degradation	No data
3) Bioaccumulative potential	
Accumulation	No data
Biodegradation	90(%)
4) Mobility in soil	No data
5) Other adverse effects	
Hazardous to the ozone layer	Not applicable

13. DISPOSAL CONSIDERATIONS

1) Disposal methods	Dispose of contents and container according to the waste control act.
2) Precautions (including disposal of contaminated container of package)	Dispose of contents and container to the applicable laws and regulations.

14. TRANSPORT INFORMATION

1) UN No.	1301
2) Proper shipping name	VINYL ACETATE, STABILIZED
3) Class or division	CLASS 3

4) Packing group	Ⅱ
5) Marine pollutant	No
6) Special safety response for transportation or transportation measure	
Emergency measure in fire	F-E
Emergency measure in spilled	S-D

15. REGULATORY INFORMATION

1) Occupational Safety and Health Act in Korea	Harmful Factors subject to Working Environment Measurement (measuring cycle : 6 months)
	Harmful Materials subject to Management
	Materials subject to Submission of Process Safety Reports (PSM)
	Substance set the Standards of Exposure
2) Chemical Control Act in Korea	Not applicable
3) Safety Control of Dangerous Substances Act in Korea	4th class First Petroleum liquids (Water Insoluble liquid) 200ℓ
4) Wastes Control Act in Korea	Designated waste
5) Other regulations in KOREA and Abroad	
Other regulation (Domestic)	
Persistent Organic Pollutants (POPs) Control	Not applicable
National regulations	
U.S.A. management information (OSHA regulation)	Not applicable
U.S.A. management information (CERCLA regulation)	2267.995 kg 5000 lb
U.S.A. management information (EPCRA 302 regulation)	453.599 kg 1000 lb
U.S.A. management information (EPCRA 304 regulation)	2267.995 kg 5000 lb
U.S.A. management information (EPCRA 313 regulation)	Applicable
U.S.A. management information (Rotterdam Convention on Substances)	Not applicable
U.S.A. management information (Stockholm Convention on Substances)	Not applicable
U.S.A. management information (Mont- real Protocol on Substances)	Not applicable
EU Classification (CLASSIFICATION)	F; R11 Carc.Cat.3; Xn; R20 Xi; R37
EU Classification (Risk Phrases)	R11, R20, R37
EU Classification (Safety Phrases)	S2, S16, S23, S29, S33

16. OTHER INFORMATION

1) Reference	ICSC(Appearance)
	ICSC(Color)
	ICSC((5) Melting point/freezing point)
	ICSC((6) Initial boiling point and boiling range)
	ICSC((7) Flash point)
	2((8) Evaporation rate)
	ICSC((10) Upper/lower flammability or explosive limits)
	ICSC((11) Vapour pressure)
	1,2((12) Solubility(ies))
	ICSC((13) Vapour density)
	ICSC((14) Relative density)
	ICSC((15) n-octanol/water partition coefficient)
	ICSC((16) Auto ignition temperature)
	2((18) Viscosity)
	3(Oral)
	4(Dermal)
	(12)(Fish)
	ICSC(Persistence)
	(13)(Biodegradation)
2) Print date	2013. 3.19
3) Revision date	
Number of revised	7

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Date of last revision 2021. 4. 02

4) Other

○ The Material Safety Data Sheet (MSDS) was prepared and edited with reference to the MSDS provided by the Korea Occupational Safety and Health Agency.