

# SAFETY DATA SHEET

SDS No.1021-58514

Date

November 27, 2014

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## 1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : VOC24 Mixture  
NAME OF MANUFACTURER : GL Sciences Inc.  
ADDRESS : 22-1 Nishishinjuku 6-chome Shinjuku-ku Tokyo 163-1130, Japan  
CHARGE SECTION : International Sales Section  
TELEPHONE No. : +81-3-5323-6620  
FACSIMILE No. : +81-3-5323-6621  
PRODUCT No. : 1021-58514  
SDS No. : 1021-58514  
Research use only.

## 2. HAZARDS IDENTIFICATION

GHS CLASSIFICATION : Flammable liquids : Category 2  
Acute toxicity - oral - : Category 4  
Eye damage/irritation : Category 2  
Carcinogenicity : Category 1  
Reproductive toxicity : Category 1  
Specific target organ toxicity (Single exposure) : Category 1<Central nervous system, optic organ, systemic toxicity>  
Specific target organ toxicity (Single exposure) : Category 3(anesthesia)  
Specific target organ toxicity (Repeated exposure) : Category 1<Central nervous system, optic organ>  
Hazardous to the aquatic environment - Acute hazard : Category 3  
Hazardous to the aquatic environment - Chronic hazard : Category 3  
Hazardous to the Ozone layer : Category 1

HAZARD SYMBOL :



SIGNAL WORD : Danger

HAZARD STATEMENTS :

H225 Highly flammable liquid and vapour  
H302 Harmful if swallowed  
H319 Cause serious eye irritation  
H350 May cause cancer  
H360 May damage fertility or the unborn child  
H370 Cause damage to organs <Central nervous system, optic organ, systemic toxicity>  
H336 May cause drowsiness or dizziness  
H372 Cause damage to organs through prolonged or repeated exposure <Central nervous system, optic organ>  
H402 Harmful to aquatic life  
H412 Harmful to aquatic life with long lasting effects  
H420 Harms public health and the environment by destroying ozone in the upper atmosphere

PRECAUTIONARY STATEMENTS :

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.  |
| P280            | Wear protective gloves/protective clothing/eye protection/face protection.   |
| P264            | Wash hands thoroughly after handling.  |
| P270            | Do not eat, drink or smoke when using this product.  |
| P260            | Do not breathe fume/gas/mist/vapours.  |
| P271            | Use only outdoors or in a well-ventilated area.  |
| P273            | Avoid release to the environment.  |
| P303+P361+ P353 | IF ON SKIN: Take off immediately all contaminated clothing. Rinse skin with water/shower.  |
| P370+P378       | In case of fire: Use appropriate media such as chemical powder or carbon dioxide to extinguish.                                  |
| P301+P312       | IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.   |
| P330            | Rinse mouth.   |
| P305+P351+P338  | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P337+P313       | If eye irritation persists: Get medical attention.   |
| P308+P313       | IF exposed or concerned: Get medical attention.  |
| P304+P340       | IF INHALED: Remove person to fresh air and a keep comfortable.   |
| P314            | Get medical attention if you feel unwell.  |
| P403+ P233+P235 | Store in a well-ventilated place. Keep container tightly closed. Keep cool.  |
| P405            | Store locked up.   |
| P501            | Dispose of contents/container in accordance with all applicable regulations.   |

3. COMPOSITION/INFORMATION ON INGREDIENTS

| CHEMICAL IDENTITY          | CONTENT | CHEMICAL FORMULA  | CAS No.    | TSCA INVENTORY | EINECS No. | EC INDEX No. |
|----------------------------|---------|---|------------|----------------|------------|--------------|
| Methanol                   | ≥97%    | CH <sub>3</sub> OH  | 67-56-1    | Listed         | 200-659-6  | 603-001-00-X |
| 1,1-Dichloroethylene       | 0.1%    | CCl <sub>2</sub> =CH <sub>2</sub>                             | 75-35-4    | Listed         | 200-864-0  | 602-025-00-8 |
| Dichloromethane            | 0.1%    | CH <sub>2</sub> Cl <sub>2</sub>                               | 75-09-2    | Listed         | 200-838-9  | 602-004-00-3 |
| tert-Buthyl methyl ether   | 0.1%    | (CH <sub>3</sub> ) <sub>3</sub> COCH <sub>3</sub>             | 1634-04-4  | Listed         | 216-653-1  | 603-181-00-X |
| trans- Buthyl methyl ether | 0.1%    | CHCl=CHCl   | 156-60-5   | Listed         | 205-860-2  | —            |
| cis-1,2-Dichloroethylene   | 0.1%    | CHCl=CHCl   | 156-59-2   | Listed         | —          | —            |
| Chloroform                 | 0.1%    | CHCl <sub>3</sub>   | 67-66-3    | Listed         | 200-663-8  | 602-006-00-4 |
| 1,1,1-Trichloroethane      | 0.1%    | CH <sub>3</sub> CCl <sub>3</sub>                              | 71-55-6    | Listed         | 200-756-3  | 602-013-00-2 |
| Tetrachloromethane         | 0.1%    | CCl <sub>4</sub>  | 56-23-5    | Listed         | 200-262-8  | 602-008-00-5 |
| 1,2-Dichloroethane         | 0.1%    | CH <sub>2</sub> ClCH <sub>2</sub> Cl                          | 107-06-2   | Listed         | 203-458-1  | 602-012-00-7 |
| Benzene                    | 0.1%    | C <sub>6</sub> H <sub>6</sub>                                 | 71-43-2    | Listed         | 200-753-7  | 601-020-00-8 |
| Trichloroethylene          | 0.1%    | CHCl=CCl <sub>2</sub>   | 79-01-6    | Listed         | 201-167-4  | 602-027-00-9 |
| 1,2-Dichloropropane        | 0.1%    | CH <sub>3</sub> CHClCH <sub>2</sub> Cl                        | 78-87-5    | Listed         | 201-152-2  | 602-020-00-0 |
| Bromodichloromethane       | 0.1%    | CHBrCl <sub>2</sub>   | 75-27-4    | Listed         | 200-856-7  | —            |
| 1,4-Dioxsane               | 0.1%    | C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>                  | 123-91-1   | Listed         | 204-661-8  | 603-024-005  |
| cis-1,3-Dichloropropene    | 0.1%    | ClCH <sub>2</sub> CH=CHCl                                     | 10061-01-5 | Not Listed     | 233-195-8  | —            |
| Toluene                    | 0.1%    | C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>                 | 108-88-3   | Listed         | 203-625-9  | 601-021-00-3 |
| trans-1,3-Dichloropropene  | 0.1%    | ClCH <sub>2</sub> CH=CHCl                                     | 10061-02-6 | Not Listed     | —          | —            |
| 1,1,2-Trichloroethane      | 0.1%    | ClCH <sub>2</sub> CHCl <sub>2</sub>                           | 79-00-5    | Listed         | 201-166-9  | 602-014-00-8 |
| Tetrachloroethylene        | 0.1%    | Cl <sub>2</sub> C=CCl <sub>2</sub>                            | 127-18-4   | Listed         | 204-825-9  | 602-028-00-4 |
| Dibromochloroethane        | 0.1%    | CHBr <sub>2</sub> Cl  | 124-48-1   | Listed         | 204-704-0  | —            |
| m-Xylene                   | 0.1%    | C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub> | 108-38-3   | Listed         | 203-576-3  | 601-022-00-9 |
| p-Xylene                   | 0.1%    | C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub> | 106-42-3   | Listed         | 203-396-5  | 601-022-00-9 |
| o-Xylene                   | 0.1%    | C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub> | 95-47-6    | Listed         | 202-422-2  | 601-022-00-9 |
| Bromoform                  | 0.1%    | CHBr <sub>3</sub>   | 75-25-2    | Listed         | 200-854-6  | 602-007-00-X |
| p-Dichlorobenzene          | 0.1%    | C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>                 | 106-46-7   | Listed         | 203-400-5  | 602-035-00-2 |

4. FIRST AID MEASURES

- GENERAL ADVICE : Consult a physician. Show this safety data sheet to the doctor in attendance.
- INHALATION : Move victim to fresh air. If breathing is difficult, give oxygen. Consult a physician.
- SKIN CONTACT : Remove contaminated clothes and shoes, rinse skin with plenty of water or shower. Use soap to help assure removal. If irritation persists, consult a physician.
- EYE CONTACT : If possible, remove any contact lenses. Flush eyes well with flooding large amounts of running water for at least 15 minutes. Assure adequate flushing by separating the eyelids with sterile fingers. Consult a physician immediately.
- INGESTION : Rinse mouth, give plenty of water to dilute the substance. Do not induce vomiting. Never give anything by mouth to an unconscious person. Consult a physician immediately.
- MOST IMPORTANT SYMPTOMS AND EFFECTS : May irritate to skin, eyes, respiratory systems.  
May induce Unconsciousness, blindness, death and headache.

5. FIRE FIGHTING MEASURES

- EXTINGUISHING MEDIA : Water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- FIRE & EXPLOSION HAZARDS : Toxic, irritating, dust/fume/smoke may be emitted. Carbon monoxide may be foamed.
- SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS : Firemen should wear normal protective equipment(full bunker gear) and positive-pressure self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

- PERSONAL PRECAUTIONS : Remove ignition sources and ventilate the area. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid raising dust and avoid contact with skin and eyes.
- ENVIROMENTAL PRECATIONS : Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
- METHODS FOR CLEAN UP : Do not touch spilled material without suitable protection. After material is completely wipe down, wash the spill site with soap and water and ventilate the area. Pull all wastes in a container for disposal and seal it tightly. Remove, clean, or dispose contaminated clothing.

7. HANDLING AND STORAGE

- HANDLING : Keep away from ignition sources and ventilate the area – No smoking. In case of insufficient ventilation, wear suitable respiratory equipment.  
Avoid contact with eyes, skin, and clothing. Avoid inhalation of vapour or mist. Avoid prolonged or repeated exposure. Handle this product with suitable protection.
- STORAGE : Store away from sunlight, heat and all ignition sources in well-ventilated dry place. Keep container tightly closed. Keep cool(2 - 10°C).
- INCOMOPATIBLE PRODUCTS : Strong oxidizers, acids

8. EXPOSURE CONTROL/PERSONAL PROTECTION

- ENGINEERING MEASURES : Use exhaust ventilation to keep airborne concentrations below exposure limits.  
Use adequate ventilation.
- VENTILATION : Local Exhaust ; Necessary, Mechanical(General) ; Necessary
- PERSONAL PROTECTION :
  - Respiratory protection : Use respirators approved under appropriate government standards and follow all regulations.
  - HAND PROTECTION : Chemical resistant gloves
  - EYE PROTECTION : Safety glasses(goggles)
  - SKIN PROTECTION : Protective clothing

CONTROL PARAMETERS

| CONTENTS                   | OSHA PEL-TWA | NIOSH REL     | ACGIH TLV-TWA |
|----------------------------|--------------|---------------|---------------|
| Methanol                   | 200ppm       | TWA 200ppm    | 200ppm        |
| 1,1-Dichloroethylene       | —            | —             | 5ppm          |
| Dichloromethane            | 25ppm        | —             | 50ppm         |
| tert-Buthyl methyl ether   | —            | —             | —             |
| trans- Buthyl methyl ether | —            | —             | —             |
| cis-1,2-Dichloroethylene   | —            | —             | —             |
| Chloroform                 | 50ppm        | Ca ST 2ppm    | 10ppm         |
| 1,1,1-Trichloroethane      | 350ppm       | C 350ppm      | 350ppm        |
| Tetrachloromethane         | 10ppm        | Ca ST 2ppm    | 5ppm          |
| 1,2-Dichloroethane         | 50ppm        | Ca TWA 1ppm   | 10ppm         |
| Benzene                    | 1ppm         | Ca TWA 0.1ppm | 0.5ppm        |
| Trichloroethylene          | 100ppm       | —             | 10ppm         |
| 1,2-Dichloropropane        | 75ppm        | —             | 10ppm         |
| Bromodichloromethane       | —            | —             | —             |
| 1,4-Dioxane                | 100ppm       | Ca C 1ppm     | 20ppm         |
| cis-1,3-Dichloropropene    | —            | —             | —             |
| Toluene                    | 200ppm       | TWA 100ppm    | 20ppm         |
| trans-1,3-Dichloropropene  | —            | —             | —             |
| 1,1,2-Trichloroethane      | —            | Ca TWA 10ppm  | 10ppm         |
| Tetrachloroethylene        | 100ppm       | —             | 25ppm         |
| Dibromochloroethane        | —            | —             | —             |
| m-Xylene                   | 100ppm       | TWA 100ppm    | 100ppm        |
| p-Xylene                   | 100ppm       | TWA 100ppm    | 100ppm        |
| o-Xylene                   | 100ppm       | TWA 100ppm    | 100ppm        |
| Bromoform                  | 0.5ppm       | TWA 0.5ppm    | 0.5ppm        |
| p-Dichlorobenzene          | 75ppm        | —             | 10ppm         |

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE : Colorless, clear liquid  
 ODOR : Characteristic odor  
 pH : No data available  
 BOILING POINT : approx.64 °C(Methanol)  
 MELTING POINT : -98 °C(Methanol)  
 FLASH POINT : 11 °C (TCC) (Methanol)  
 EXPLOSIVE LIMITS : 6.0% (lower), 35.6 % (upper) (Methanol)  
 VAPOR PRESSURE : 12.3 kPa (at 20°C) (Methanol)  
 VAPOR DENSITY : 1.11(Methanol)  
 SPECIFIC GRAVITY : 0.729 g/cm<sup>3</sup> (at 20/4°C) (Methanol)  
 SOLUBILITY IN  
     Water : Miscible  
     Organic solvent : Miscible  
 PARTITION COEFFICIENT ; n-octanol/water : log Pow: -0.82/-0.66(Methanol)  
 AUTOIGNITION TEMPERATURE : 464°C(Methanol)  
 DECOMPOSITION TEMPERATURE : No data available

10. STABILITY AND REACTIVITY

REACTIVITY : Stable under recommended storage conditions.  
 CHEMICAL STABILITY : Deteriorated by sun-light.  
 CONDITION TO AVOID : Sunlight, heat, open flames, high temperature, sparks, static electrical charge  
 INCOMPATIBLE MATERIALS : Oxidizers and strong acids  
 HAZARDOUS DECOMPOSITION PRODUCTS : CO, CO<sub>2</sub>, Cl, HCl may be formed.

**11. TOXICOLOGICAL INFORMATION**

|  |   |
|--|---|
| ACUTE TOXICITY -oral-                                | : rat; LD50 = 6200mg/kg, 9100mg/kg(EHC 196,1997)<br>Acute toxicity of Methanol affects primates stronger than rodents(EHC 196,1997).<br>Human; LD50=1400mg/kg(DFGOT vol.16,2001). |
| SKIN CORROSION/IRRITATION                            | : Methanol is Not classified.   |
| EYE DAMAGE/EYE IRRITATION<br>(Chloroform)            | : rabbit: strong irritation.(EHC163,1994)   |
| RESPIRATORY OR SKIN SENSITIZATION                    | : It cannot conclude that Methanol has sensitization.(DFGOT vol.16,2001)  |
| GERM CELL MUTAGENICITY                               | : Methanol is Not classified.   |
| CARCINOGENICITY                                      |   |
| (Benzene)  | : K(NTP,2005), 1(IARC,1987), A1(ACGIH,2001), A(EPA,2000)  |
| (Trichloroethylene)                                  | : R(NTP,2005), 2A(IARC,1987)  |
| (Tetrachloroethylene)                                | : R(NTP,2005), 2A(IARC,1995)  |
| REPRODUCTIVE TOXICITY                                |   |
| (Methanol)   | : Methanol has a potential impact on human development(NTP-CHRHR Monograph,2003).   |
| (Trichloroethylene)                                  | : An action change of young animal.(CERI/NITE,2004)   |
| (p-Xylene)   | : Teratogenesis assay: Positive(CERI/NITE,2004)   |
| (p-Dichlorobenzene)                                  | : Reproductive toxicity assay: Positive.(OECDTG416, EU-RARNo.48(2004))  |
| SPECIFIC TARGET ORGAN TOXICITY - single exposure -   |   |
| (Methanol)   | : Central nervous depression (acute toxicity), metabolic acidosis, visual defect, blindness, headache, dizziness, vomiting, narcosis, death(DFGOT vol.16,2001).                   |
| SPECIFIC TARGET ORGAN TOXICITY - repeated exposure - |   |
| (Methanol)   | : disorder of the eye, blindness(EHC 196(1997), ACGIH(7th,2001)).   |
| ASPIRATION HAZARD                                    | : Classification not possible on this product.  |

**12. ECOLOGICAL INFORMATION**

|                                      |   |
|--------------------------------------|---|
| Hazardous to the aquatic environment |   |
| (Tetrachloromethane)                 | : Preudokirchneriel lasubcapitata: ErC50=0.46mg/L/72hr(MOE,2002)  |
| (Tetrachloroethylene)                | : Ceriodaphnia dubia: EC50=0.602mg/L/48hr(NITE,2006)  |
| (o-Xylene)                           | : Selenastrum: ErC50=0.8mg/L/72hr(MOE,1996)   |
| (p-Dichlorobenzene)                  | : Ceriodaphnia dubia: EC50=0.7mg/L/48hr(NITE,2005)  |
| Hazardous to the Ozone layer         | : Tetrachloromethane is the Ozone-Depleting substance in Group II, Annex B of the Montreal Protocol. Ozone-Depleting Potential: 1.1, GWP: 0.34 - 0.35 |
| BIODEGRADABILITY                     | : There are no rapid biodegradation in Tetrachloromethane(0%), Tetrachloroethylene(11%), p-Dichlorobenzene(0%).                                       |
| BIOACCUMULATIVE POTENTIAL            | : Tetrachloromethane: BCF=3.2 - 7.4(10µg/L), 3.8 - 11.0(1.0µg/L)  |
| MOBILITY IN SOIL                     | : No data available   |

**13. DISPOSAL INFORMATION**

Dispose in a hazardous-waste site in accordance with all applicable regulations. Any disposal practice must be in compliance with country, local, state, and federal laws and regulations (contact country, local or state environment agency for specific rules).

**14. TRANSPORT INFORMATION**

|                         |   |
|-------------------------|---|
| IATA                    |   |
| UN NUMBER               | : 1986  |
| UN PROPER SHIPPING NAME | : Alcohols, Flammable, Toxic, N.O.S (Methanol solution) |
| CLASS                   | : 3, flammable liquid (6.1, toxic substances)           |
| PACKING GROUP           | : II  |
| ADR/RID                 | : 1986, Alcohols, Flammable, Toxic, N.O.S               |
| DOT                     | : 1986, Alcohols, Flammable, Toxic, N.O.S               |
| MARINE POLLUTANT        | : Yes   |

## 15. REGULATORY INFORMATION

US REGULATIONS : Labeling according to EC Directives; See section 2

EU REGULATIONS : Labeling according to EC Directives; See section 2

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## 16. OTHER INFORMATION

## NOTICE:

The information contained in the SDS description is applicable exclusively to the chemical substance identified herein and for its intended use as an analytical reference standard or reagent and to the unit quantity intended for that purpose. The information does not relate to, and may not be appropriate for, any application or larger quantity of the substance described. Our products are intended for the use by individuals possessing sufficient technical skill and qualification on use the material potential hazardous chemical. Accordingly, no representation or warranty, express or implied, with respect to merchantability and fitness for a particular purpose is made with respect to the information contained herein.

## Attention:

This product in terms of chemical identity and the unit amount provide is intended for use in chemical analysis and not for human consumption, nor any other purpose.