

SECTION 1: Identification

Product identifiers:

Product trade name: Kalama* Florosol S
Company product number: FLOROSOLS
Other means of identification: 32202; 2H-Pyran-4-ol, tetrahydro-4-methyl-2-(2-methylpropyl)-

Recommended use of the chemical and restrictions on use:

Uses: Fragrance ingredient; Industrial applications.
Restrictions on use: Consumer products with potential for significant oral contact.

Details of the supplier:

Manufacturer/Supplier: Emerald Kalama Chemical Limited
 Dans Road
 Widnes, Cheshire WA8 0RF
 United Kingdom
 Telephone: +44 (0) 151 423 8000
 Email: product.compliance@emeraldmaterials.com

For further information about this SDS:

Emergency telephone number:

ChemTel (24 hours): 1-800-255-3924 (USA); +1-813-248-0585 (outside USA);
 1-300-954-583 (Australia); 000-800-100-4086 (India).

SECTION 2: Hazard(s) identification

Classification of the substance or mixture:

Skin Irritation, category 3, H316
 Eye Irritation, category 2, H319

Label elements:**Hazard pictogram(s):****Signal word:**

Warning

Hazard statements:

H316 Causes mild skin irritation.
 H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.
 P280 Wear eye protection/face protection.
 P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P332+P313 If skin irritation occurs: Get medical advice/attention.
 P337+P313 If eye irritation persists: Get medical advice/attention.

Supplemental information: No Additional Information

Classification and hazards statements are listed according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS). Regulations in individual countries/regions may determine which classifications and hazard statements are applicable based on adopted hazard classes and categories. Precautionary statements are listed according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Annex III. Regulations in individual countries/regions may determine which statements are required on the product label. See product label for specifics.

Other hazards: No Additional Information

See Section 11 for toxicological information.

SECTION 3: Composition/information on ingredients

Substance:

<u>CAS-No.</u>	<u>Chemical Name</u>	<u>Weight%</u>
----------------	----------------------	----------------

<u>CAS-No.</u>	<u>Chemical Name</u>	<u>Weight%</u>
0063500-71-0	Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	98-100

Amounts specified are typical and do not represent a specification. Remaining components are proprietary, non-hazardous, and/or present at amounts below reportable limits.

SECTION 4: First-aid measures

Description of first aid measures:

General: If irritation or other symptoms occur or persist from any route of exposure, remove the affected individual from the area: see a physician/get medical attention.

Eye contact: Immediately flush eyes with plenty of clean water for an extended time, not less than fifteen (15) minutes. Flush longer if there is any indication of residual chemical in the eye. Ensure adequate flushing of the eyes by separating the eyelids with fingers and roll eyes in a circular motion. If eye irritation persists: Get medical advice/attention.

Skin contact: Immediately remove contaminated clothing and shoes. Wash the affected area with plenty of soap and water until no evidence of the chemical remains (at least 15-20 minutes). Launder clothing before reuse. If skin irritation occurs: Get medical advice/attention.

Inhalation: If affected, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a POISON CENTER or doctor/physician if you feel unwell.

Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse out the mouth with water. Get medical attention immediately.

Protection of first aid responders: Wear proper personal protective clothing and equipment.

Most important symptoms and effects, both acute and delayed: Irritation. Pre-existing skin problems may be aggravated by prolonged or repeated contact. See section 11 for additional information.

Indication of any immediate medical attention and special treatment needed, if necessary: Treat symptomatically.

SECTION 5: Fire-fighting measures

Extinguishing media:

Suitable: Use water spray, ABC dry chemical, foam or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unsuitable: None known.

Special hazards arising From the chemical:

Unusual fire/explosion hazards: Product is not considered a fire hazard, but will burn if ignited. Closed container may rupture (due to build up in pressure) when exposed to extreme heat.

Hazardous combustion products: Irritating or toxic substances may be emitted upon burning, combustion or decomposition. See section 10 (Hazardous decomposition products) for additional information.

Special protective equipment and precautions for fire-fighters: Wear self-contained breathing apparatus (SCBA) equipped with a full facepiece and operated in a pressure-demand mode (or other positive pressure mode) and approved protective clothing. Personnel without suitable respiratory protection must leave the area to prevent significant exposure to hazardous gases from combustion, burning or decomposition. In an enclosed or poorly ventilated area, wear SCBA during cleanup immediately after a fire as well as during the attack phase of firefighting operations.

See section 9 for additional information.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: See Section 8 for recommendations on the use of personal protective equipment. If spilled in an enclosed area, ventilate. Eliminate ignition sources. Personal Protective Equipment must be worn.

Environmental precautions: Do not flush liquid into public sewer, water systems or surface waters.

Methods and materials for containment and cleaning up: Contain by diking with sand, earth or other non-combustible material. Wear proper personal protective clothing and equipment. Absorb spill with an inert material. Place into labeled, closed container; store in safe location to await disposal. Change contaminated clothing and launder before reuse.

SECTION 7: Handling and storage

Precautions for safe handling: As with any chemical product, use good laboratory/workplace procedures. Do not cut, puncture, or weld on or near the container. Wash thoroughly after handling this product. Always wash up before eating, smoking or using the

SDS Name: Kalama* Florosol S

facilities. Use under well-ventilated conditions. Avoid eye and skin contact. Avoid inhalation of aerosol, mist, spray, fume or vapor. Avoid drinking, tasting, swallowing or ingesting this product. Wash contaminated clothing before reuse. Provide eyewash fountains and safety showers in the work area.

Conditions for safe storage, including any incompatibilities: Store cool and dry, under well-ventilated conditions. Store this material away from incompatible substances (see section 10). Do not store in open, unlabeled or mislabeled containers. Keep container closed when not in use. Do not reuse empty container without commercial cleaning or reconditioning. Empty container contains residual product which may exhibit hazards of product.

SECTION 8: Exposure controls / personal protection

Control parameters:

Occupational exposure limits (OEL):

Chemical Name	ACGIH - TWA/Ceiling	ACGIH - STEL			
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	N/E				
Chemical Name	Australia	New Zealand	Korea	Indonesia	
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	N/E	N/E	N/E	N/E	
Chemical Name	Japan ISHL	Japan JSOH	Taiwan	Malaysia	
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	N/E	N/E	N/E	N/E	
Chemical Name	Philippines	Singapore			
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	N/E	N/E			

N/E=Not established (no exposure limits established for the listed substances for listed country/region/organization).

Exposure controls:

Appropriate engineering controls: Always provide effective general and, when necessary, local exhaust ventilation to draw spray, aerosol, fume, mist and vapor away from workers to prevent routine inhalation. Ventilation must be adequate to maintain the ambient workplace atmosphere below the exposure limit(s) outlined in the SDS.

Individual protection measures, such as personal protective equipment:

Eye/face protection: Safety glasses or goggles required.

Skin and body protection: Wear chemical resistant (impervious) gloves. Use good laboratory/workplace procedures including personal protective clothing: labcoat, safety glasses and protective gloves.

Respiratory protection: Respiratory protection is not needed with proper ventilation. In case of insufficient ventilation, wear suitable respiratory equipment.

Further information: Eyewash fountains and safety showers are recommended in the work area.

SECTION 9: Physical and chemical properties

Form:	Liquid	pH:	Not Available
Appearance:	Colorless to light yellow	Relative density:	0.943-0.953
Odor:	Floral	Partition coefficient (n-octanol/water):	1.65 (23°C)
Odor threshold:	Not Available	% Volatile by weight:	Not Available
Solubility in water:	23-24 g/L @ 23°C	VOC:	Not Available
Evaporation rate:	Not Available	Boiling point °C:	227 °C
Vapor pressure:	1 Pa @ 20°C	Boiling point °F:	440 °F
Vapor density:	Not Available	Flash point:	106 °C (223 °F) Closed Cup
Viscosity:	234 mPa.s (20°C)	Auto-ignition temperature:	328°C (622°F)
Melting point/Freezing point:	<-100°C (<-148°F)	Flammability (solid, gas):	Not Applicable (liquid)
Oxidizing properties:	Not oxidizing	Flammability or explosive limits:	LFL/LEL: Not Available
Explosive properties:	Not explosive		UFL/UEL: Not Available
Decomposition temperature:	Not Available		

Other information: Amounts specified are typical and do not represent a specification.

SECTION 10: Stability and reactivity

Reactivity: None known.

Chemical stability: This product is stable.

Possibility of hazardous reactions: Hazardous polymerization will not occur.

SDS Name: Kalama* Florosol S

Conditions to avoid: Excessive heat and ignition sources.

Incompatible materials: Avoid contact with strong oxidizing agents.

Hazardous decomposition products: Carbon dioxide, carbon monoxide and hydrocarbons.

SECTION 11: Toxicological information

Information on likely routes of exposure:

General: Caution must be exercised through the prudent use of protective equipment and handling procedures to minimize exposure.

Eyes: Causes serious eye irritation.

Skin: Causes mild skin irritation.

Inhalation: High airborne concentrations of vapors resulting from heating, misting or spraying may cause irritation of the respiratory tract and mucous membranes.

Ingestion: Ingestion may cause irritation.

Acute toxicity information: Not classified (based on available data, the classification criteria are not met).

<u>Chemical Name</u>	<u>Inhalation LC50</u>	<u>Species</u>	<u>Oral LD50</u>	<u>Species</u>	<u>Dermal LD50</u>	<u>Species</u>
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	N/E	N/E	>2000 mg/kg	Rat/ adult	>2000 mg/kg	Rabbit/ adult

Skin corrosion/irritation: Causes mild skin irritation - Category 3.

<u>Chemical Name</u>	<u>Skin Irritation</u>	<u>Species</u>
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	Mild irritant	Rabbit/ adult

Serious eye damage/irritation: Causes serious eye irritation - Category 2 (2A).

<u>Chemical Name</u>	<u>Eye irritation</u>	<u>Species</u>
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	Irritant	Rabbit/ adult

Respiratory or skin sensitization: Not classified (based on available data, the classification criteria are not met).

<u>Chemical Name</u>	<u>Skin sensitisation</u>	<u>Species</u>
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	Non-sensitizer	Guinea Pig/ adult

Carcinogenicity: Not classified (no relevant information found).

Germ cell mutagenicity: Not classified (based on available data, the classification criteria are not met). TETRAHYDRO-2-ISOBUTYL-4-METHYLPYRAN-4-OL, MIXED ISOMERS (cis and trans): Mutagenic assays were negative for both in vivo and in vitro assays.

Reproductive toxicity: Not classified (based on available data, the classification criteria are not met). TETRAHYDRO-2-ISOBUTYL-4-METHYLPYRAN-4-OL, MIXED ISOMERS (cis and trans): Reproductive toxicity, oral, rats: NOAEL (no-observed adverse-effect-level) 1113 mg/kg bw/day (OECD 443). Reproductive toxicity, dermal, rats: NOAEL (no-observed adverse-effect-level) 1000 mg/kg bw/day (OECD 414). Developmental toxicity, oral, rats: NOAEL of 1113 mg/kg bw/day (OECD 443). Developmental toxicity dermal, rats: NOAEL (no-observed-adverse-effect level), maternal toxicity=1000 mg/kg bw/day; NOAEL, developmental toxicity=1000 mg/kg bw/day (OECD 414).

Specific target organ toxicity (STOT) - single exposure: Not classified (based on available data, the classification criteria are not met).

Specific target organ toxicity (STOT) - repeated exposure: Not classified (based on available data, the classification criteria are not met). TETRAHYDRO-2-ISOBUTYL-4-METHYLPYRAN-4-OL, MIXED ISOMERS (cis and trans): Repeated dose toxicity study: NOAEL (No-Observed-Adverse-Effect-Level), oral, rat - 125 mg/kg bw/day; NOAEL, dermal, rat - 1000 mg/kg bw/day.

Aspiration hazard: Not classified (based on available data, the classification criteria are not met).

Other toxicity information: No additional information available.

SECTION 12: Ecological information

Ecotoxicity:

<u>Chemical Name</u>	<u>Species</u>	<u>Acute</u>	<u>Acute</u>	<u>Chronic</u>
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	Fish	LC50 354 mg/L (96 hours)	N/E	N/E
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	Invertebrates	EC50 320 mg/L (48 hours)	N/E	N/E
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	Algae	EC50 >100 mg/L (72 hours)	EC50 >1000 mg/L(72 hours)	EC10 232 mg/L(72 hours)
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	Micro-organisms	EC50 >1000 mg/L (3 hours)		

Persistence and degradability:

<u>Chemical Name</u>	<u>Biodegradation</u>
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	Inherently biodegradable (OECD 301D)

Bioaccumulative potential:

<u>Chemical Name</u>	<u>Bioconcentration Factor (BCF)</u>	<u>Log Kow</u>
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	N/E	1.65 (23°C)

Mobility in soil:

<u>Chemical Name</u>	<u>Mobility in soil (Koc/Kow)</u>
Tetrahydro-2-isobutyl-4-methylpyran-4-ol, mixed isomers (cis and trans)	25 (OECD 121)

Other adverse effects: No additional information available.

SECTION 13: Disposal considerations

Dispose of unused contents (incineration) in accordance with national and local regulations. Dispose of container in accordance with national and local regulations. Ensure the use of properly authorized waste management companies, where appropriate.

See Section 8 for recommendations on the use of personal protective equipment.

SECTION 14: Transport information

The information below is provided to assist in documentation. It may supplement the information on the package. The package in your possession may carry a different version of the label depending on the date of manufacture. Depending on inner packaging quantities and packaging instructions, it may be subject to specific regulatory exceptions.

UN number: N/A

UN proper shipping name:

Not regulated - See Bill of Lading for Details

Transport hazard class(es):

U.S. DOT hazard class: N/A
 Canada TDG hazard class: N/A
 Europe ADR/RID hazard class: N/A
 IMDG Code (ocean) hazard class: N/A
 ICAO/IATA (air) hazard class: N/A

A "N/A" listing for the hazard class indicates the product is not regulated for transport by that regulation.

Packing group: N/A

Environmental hazards:

Marine pollutant: Not Applicable
Hazardous substance (USA): Not Applicable

Special precautions for user: Not Applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:

Not Applicable

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question:

Japan regulations:

Japan Industrial Safety and Health Law:

Chemical name
No subject chemicals

Category

Japan Fire Service Law:

Chemical name
No subject chemicals

Category

Japan Poisonous and Deleterious Substances:

Chemical name
No subject chemicals

Category

Threshold

Japan Prevention of Marine Pollution and Disaster:

Chemical name
No subject chemicals

Category

Japan Chemical Substances Control Law:

Chemical name
No subject chemicals

Category

Notes

Other regulations: No Additional Information

Chemical inventories:

Regulation

Status

Australian Inventory of Industrial Chemicals (AIIC):
 Canadian Domestic Substances List (DSL):
 Canadian Non-Domestic Substances List (NDSL):
 China Inventory of Existing Chemical Substances (IECSC):
 European EC Inventory (EINECS, ELINCS, NLP):
 Japan Existing and New Chemical Substances (ENCS):
 Japan Industrial Safety and Health Law (ISHL):
 Korean Existing and Evaluated Chemical Substances (KECL):
 New Zealand Inventory of Chemicals (NZIoC):
 Philippines Inventory of Chemicals and Chemical Substances (PICCS):
 Taiwan Inventory of Existing Chemicals:
 U.S. Toxic Substances Control Act (TSCA) (Active):

Y
Y
N
Y
Y
Y
Y
Y
Y
Y
Y
Y

A "Y" listing indicates all intentionally added components are either listed or are otherwise compliant with the regulation. A "N" listing indicates that for one or more components: 1) there is no listing on the public inventory (or is not on the ACTIVE inventory for U.S. TSCA); 2) no information is available; or 3) the component has not been reviewed. A "Y" for New Zealand may mean that a qualified group standard may exist for the components in this product.

Chemical inventory notes: New Zealand: One or more components may be covered by a group standard.

Europe REACH (EC) 1907/2006: Applicable components are registered, exempt or otherwise compliant. EU REACH is only relevant to substances either manufactured or imported into the EU. Emerald Performance Materials has met its obligations under the EU REACH regulation. EU REACH information regarding this product is provided for informational purposes only. Each Legal Entity may have differing EU REACH obligations, depending on their place in the supply chain. For material manufactured outside of the EU, the importer of record must understand and meet their specific obligations under the regulation.

SECTION 16: Other information

Legend:

* : Trademark owned by Emerald Performance Materials, LLC.
 ACGIH: American Conference of Governmental Industrial Hygienists
 N/A: Not Applicable
 N/E: None Established
 STEL: Short Term Exposure Limit
 TWA: Time Weighted Average (exposure for 8-hour workday)

Users Responsibility/Disclaimer of Liability:

The information set forth herein is based on our current knowledge, and is intended to describe the product solely with respect to health, safety and the environment. As such, it must not be interpreted as a guarantee of any specific property of the product. As a result, the customer shall be solely responsible for deciding whether said information is suitable and beneficial.

Safety Data Sheet Preparer:
 Product Compliance Department
 Emerald Performance Materials, LLC
 1499 SE Tech Center Place, Suite 300
 Vancouver, WA 98683
 United States