

SAFETY DATA SHEET

PRODUCT NAME	KEM AQUA Titrant TR-3	Data of issue	6/11/2018
		Date of revision	2/4/2024
		(Confirmation)	

1. Identification of the substance or mixture and the supplier

Product name	KEM AQUA Titrant TR-3
SDS No.	GHS-0063E
Name of supplier	Kyoto Electronics Manufacturing Co., Ltd.
Address	68 Ninodan-cho, Shinden, Kisshoin, Minami-ku, Kyoto, Japan
Division	Quality Assurance Department
Phone	+81-75-691-4121
Fax	+81-75-691-4127
Recommended uses and restrictions on use	
Recommended use	For analysis
Restrictions on use	When using for purposes other than those recommended, consult a specialist.

2. Hazard identification

GHS classification

Health hazards

Acute toxicity (Inhalation)	Category 4
Skin corrosion / Irritation	Category 1
Serious eye damage / Eye irritation	Category 1
Skin sensitization	Category 1
Reproductive toxicity	Category 2
Specific target organ toxicity (single exposure)	Category 2 (Respiratory organs) Category 3 (Narcotic effects)
Specific target organ toxicity (repeated exposure)	Category 2 (Liver, Thyroid, respiratory tract system)

Environmental hazards

Short-term (acute) aquatic hazard	Category 2
-----------------------------------	------------

GHS label elements

Hazard pictograms



Signal word	Danger
Hazard statements	H314 Causes severe skin burns and eye damage. H317 May cause an allergic skin reaction. H332 Harmful if inhaled. H336 May cause drowsiness or dizziness. H361 Suspected of damaging fertility or the unborn child. H371 May cause damage to organs (Respiratory organs). H373 May cause damage to organs (Liver, Thyroid gland, respiratory tract system) through prolonged or repeated exposure. H401 Toxic to aquatic life.
Precautionary statement	
Prevention	P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P260 Do not breathe mist or vapors. P264 Wash skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P271 Use only outdoors or in a well-ventilated area. P272 Contaminated work clothing should not be allowed out of the workplace. P273 Avoid release to the environment. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response	P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor. P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor. P308 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor. P333 + P313 If skin irritation or rash occurs: Get medical

	If eye irritation persists, consult a specialist.
	Remove contact lenses, if present and easy to do. Continue rinsing.
If swallowed	Keep respiratory tract clear.
	Do NOT induce vomiting.
	Never give anything by mouth to an unconscious person.
	If symptoms persist, call a physician.
	Take victim immediately to hospital.
Most important symptoms and effects, both acute and delayed	May cause an allergic skin reaction.
	Causes serious eye damage.
	Harmful if inhaled.
	May cause drowsiness or dizziness.
	Suspected of damaging fertility or the unborn child.
	May cause damage to organs.
	May cause damage to organs through prolonged or repeated exposure.
	Causes severe skin burns and eye damage.
Notes to physician	Treat symptomatically.

5. Fire-fighting measures

Suitable extinguishing media	Carbon dioxide (CO ₂)
	Dry sand
	Regular foam
	Vermiculite
Unsuitable extinguishing media	High volume water jet
Specific hazards during fire fighting	Do not allow run-off from fire fighting to enter drains or water courses.
Specific extinguishing methods	Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for fire-fighters	Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Use personal protective equipment.
	Ensure adequate ventilation.
Environmental precautions	Prevent product from entering drains.

Prevent further leakage or spillage if safe to do so.

If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling

Advice on protection against fire and explosion Normal measures for preventive fire protection.

Advice on safe handling

- Avoid formation of aerosol.
- Do not breathe vapors/dust.
- Avoid exposure - obtain special instructions before use.
- Avoid contact with skin and eyes.
- For personal protection see section 8.
- Smoking, eating and drinking should be prohibited in the application area.
- Provide sufficient air exchange and/or exhaust in work rooms.
- To avoid spills during handling keep bottle on a metal tray.
- Dispose of rinse water in accordance with local and national regulations.
- Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Avoidance of contact No data available

Hygiene measures When using do not eat or drink.

When using do not smoke.

Wash hands before breaks and at the end of workday.

Storage

Conditions for safe storage

- Keep container tightly closed in a dry and well-ventilated place.
- Containers which are opened must be carefully resealed and kept upright to prevent leakage.
- Observe label precautions.
- Electrical installations / working materials must comply with the technological safety standards.

Further information on storage stability No decomposition if stored and applied as directed.

8. Exposure controls/Personal protection

Threshold limit value and permissible exposure limits for each component in the work environment

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Reference concentration / Permissible concentration	Basis	
iodine	7553-56-2	OEL-M	0.1ppm 1mg/m ³	JP OEL JSOH	
		Further information: Skin sensitizing agent; Group 2 substances which probably induce allergic reactions in humans.			
		OEL-M	1ppm 1mg/m ³	JP OEL JSOH	
		Further information: Skin sensitizing agent; Group 2 substances which probably induce allergic reactions in humans.			
		TWA(Inhalable fraction and vapor)	0.01ppm	ACGIH	
STEL(Vapor)	0.1ppm	ACGIH			
TWA(Inhalable fraction and vapor)	1ppm	ACGIH			
STEL(Vapor)	1ppm	ACGIH			
sulphur dioxide	7446-09-5	STEL	0.25pm	ACGIH	

Personal protective equipment

Respiratory protection

Suitable respiratory equipment

Hand protection material

Protective gloves

The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection

Eye wash bottle with pure water

Tightly fitting safety goggles

Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection

Protective suit

9. Physical and chemical properties

Physical state	Liquid.
Color	Dark brown
Odor	Pungent
Melting point / Freezing point	No data available

Initial boiling point and boiling range	No data available
Flammability (liquids)	No data available
Lower explosion limit and upper explosion limit / flammability limit	
Upper explosion limit / Upper flammability limit	No data available
Lower explosion limit / Lower flammability limit	No data available
Flash point	110°C (Cleveland open cup)
Decomposition temperature	No data available
pH	No data available
Autoignition temperature	No data available
Self-Accelerating decomposition temperature (SADT)	No data available
Viscosity	
Viscosity, kinematic	11.065mm ² /s
Solubility(ies)	
Water solubility	completely soluble
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Vapor pressure	No data available
Density and / or relative density Relative density	1.06 (20°C)
Density	No data available
Relative vapor density	No data available
Particle characteristics Particle size	No data available

10. Stability and reactivity

Reactivity	No decomposition if stored and applied as directed.
Chemical stability	No decomposition if stored and applied as directed.
Possibility of hazardous reactions	No decomposition if stored and applied as directed.
Conditions to avoid	No data available
Incompatible materials	No data available

11. Toxicological information

Acute toxicity	Harmful if inhaled.
Product	
Acute oral toxicity	Acute toxicity estimate >2,000 mg/kg (Calculation method)
Acute inhalation toxicity	Acute toxicity estimate 11,865 ppm (Calculation method), Exposure time 4 h, Test atmosphere gas
Acute dermal toxicity	Acute toxicity estimate >2,000 mg/kg (Calculation method)

2-(2-ethoxyethoxy)ethanol

Acute oral toxicity	LD50 (Rat) 5,540mg/kg
Acute inhalation toxicity	LC50 (Rat) >1.39mg/L, Exposure time 4 h, Test atmosphere dust / mist
Acute dermal toxicity	LD50 (Rabbit) 8,500 mg/kg

imidazole

Acute oral toxicity	LD50 (Rat) 960mg/kg
---------------------	---------------------

iodine

Acute oral toxicity	LD50 (Rat) 14,000mg/kg
Acute inhalation toxicity	LC50 (Rat) >4.588mg/L, Exposure time 4 h, Test atmosphere dust / mist LCLo (Rat) 800mg/m ³ , Exposure time 1h, Test atmosphere vapor
Acute dermal toxicity	LD50 (Rabbit) 1,450 mg/kg

sulphur dioxide

Acute inhalation toxicity	LC50 (Rat) 593 - 1319ppm, Exposure time 4 h, Test atmosphere gas
---------------------------	--

Skin corrosion/irritation

Causes severe skin burns and eye damage.

Product	Extremely corrosive and destructive to tissue.
---------	--

imidazole	Corrosive after 4 hours or less of exposure
-----------	---

iodine	Skin irritation
--------	-----------------

Serious eye damage/eye irritation

Causes serious eye damage.

Product	May cause irreversible eye damage.
---------	------------------------------------

2-(2-ethoxyethoxy)ethanol	Causes eye irritation.
---------------------------	------------------------

imidazole	Causes serious eye damage.
-----------	----------------------------

iodine	Causes serious eye irritation.
--------	--------------------------------

sulphur dioxide	Causes serious eye irritation.
-----------------	--------------------------------

Respiratory or skin sensitization

Skin sensitization

May cause an allergic skin reaction.

Respiratory sensitization

Not classified based on available information.

Product	Causes sensitization.
---------	-----------------------

iodine	Probability or evidence of skin sensitization in humans
--------	---

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Suspected of damaging fertility or the unborn child.

imidazole	Suspected human reproductive toxicant
-----------	---------------------------------------

iodine	Suspected human reproductive toxicant
--------	---------------------------------------

STOT-single exposure

May cause drowsiness or dizziness.

May cause damage to organs (Respiratory organs).

2-(2-ethoxyethoxy)ethanol	The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.
---------------------------	--

iodine	Target Organs Respiratory organs
--------	----------------------------------

The substance or mixture is classified as specific target organ toxicant, single

	exposure, category 1.
sulphur dioxide	Target Organs Respiratory organs The substance or mixture is classified as specific target organ toxicant, single exposure, category 1.
STOT-repeated exposure	May cause damage to organs (Liver, Thyroid gland, respiratory tract system) through prolonged or repeated exposure.
imidazole	Target Organs Liver The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.
iodine	Target Organs Thyroid The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.
sulphur dioxide	Target Organs Respiratory organs The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.
Aspiration toxicity	Not classified based on available information.
Remarks	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Concentrations substantially above the TLV value may cause narcotic effects. Solvents may degrease the skin.

12. Ecological information

Ecotoxicity

2-(2-ethoxyethoxy)ethanol

Toxicity to fish LC50 (Pimephales promelas (fathead minnow)) 9,650 mg/L, Exposure time 96 h

Toxicity to daphnia and other aquatic invertebrates EC50 (Daphnia magna (Water flea)) 3,340 mg/L, Exposure time 48 h

Imidazole

Toxicity to daphnia and other aquatic invertebrates EC50 (Daphnia magna (Water flea)) 341.5 mg/L, Exposure time 48 h

Toxicity to algae/aquatic plants EC50 (Desmodesmus subspicatus (green algae)) 133 mg/L, End point Growth inhibition, Exposure time 72 h
EC50 (Desmodesmus subspicatus (green algae)) 25 mg/L, End point Growth inhibition, Exposure time 72 h

iodine

Toxicity to fish LC50 (Oncorhynchus mykiss (rainbow trout)) 0.53 mg/L, Exposure time 96 h

Toxicity to daphnia and EC50 (Daphnia magna (Water flea)) 0.16 mg/L, Exposure time 48 h

other aquatic invertebrates	
M-Factor (Acute aquatic toxicity)	1
Persistence and degradability	
2-(2-ethoxyethoxy)ethanol	rapidly biodegradable
imidazole	rapidly biodegradable, Biodegradation 98%, Exposure time 18d (OECD Test Guideline 301A)
Bioaccumulative potential	
2-(2-ethoxyethoxy)ethanol	Partition coefficient: n-octanol/water log Pow = - 0.54
imidazole	Bioconcentration factor (BCF) 3.16 Partition coefficient: n-octanol/water log Pow = - 0.02 (25°C)
iodine	Partition coefficient: n-octanol/water log Pow = - 2.49
Mobility in soil	No data available
Hazardous to the ozone layer	Not applicable
Other adverse effects	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Toxic to aquatic life.

13. Disposal considerations

Waste from residues	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

14. Transport information

International Regulations

IATA-DGR

UN / ID No.	UN1760
Proper shipping name	Corrosive liquid, n.o.s. (Imidazole, solution)
Class	8
Packing group	II
Labels	Corrosive
Packing instruction (cargo aircraft)	855
Packing instruction (passenger aircraft)	851

IMDG-Code

UN No.	UN1760
Proper shipping name	CORROSIVE LIQUID, N.O.S. (Imidazole, solution)
Class	8
Packing group	II
Labels	8
EmS Code	F-A, S-B
Marine pollutant	no

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

Not applicable for product as supplied.

Domestic regulation

Please refer to the law and local regulations, etc. in each country

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. Regulatory information

16. Other information

Full text of other abbreviations

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
JP OEL JSOH	Japan. The Japan Society for Occupational Health. Recommendation of Occupational Exposure Limits
ACGIH/TWA	8-hour, time-weighted average
ACGIH/STEL	Short-term exposure limit
JP OEL JSOH / OEL-M	Occupational Exposure Limit-Mean

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing

Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.