

according to Regulation UK SI 2019/758 and UK SI 2020/1577 as amended

Creation Date 07-Jul-2009

Revision Date 30-Nov-2024

Revision Number 4

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THECOMPANY/UNDERTAKING

1.1. Product identifier	
Product Description: Cat No. :	IsopropyImagnesium bromide, 3M solution in 2-MethyItetrahydrofuran H54840
1.2. Relevant identified uses of the	substance or mixture and uses advised against
Recommended Use Uses advised against	Laboratory chemicals. No Information available
1.3. Details of the supplier of the sa	afety data sheet
Company	Avocado Research Chemicals Ltd. (Part of Thermo Fisher Scientific) Shore Road, Heysham Lancashire, LA3 2XY, United Kingdom Office Tel: +44 (0) 1524 850506 Office Fax: +44 (0) 1524 850608
E-mail address	begel.sdsdesk@thermofisher.com
1.4. Emergency telephone number	For information US call: 001-800-227-6701 / Europe call: +32 14 57 52 11 Emergency Number US :001-201-796-7100 / Europe : +32 14 57 52 99 CHEMTREC Tel. No. US :001-800-424-9300 / Europe :001-703-527-3887
Poison Centre - Emergency information services	Ireland : National Poisons Information Centre (NPIC) - 01 809 2166 (8am-10pm, 7 days a week) Malta : +356 2395 2000 Cyprus : +357 2240 5611

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

GHS Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567		
Physical hazards		
Flammable liquids Substances/mixtures which, in contact with water, emit flammable gases	Category 2 (H225) Category 1 (H260)	
Health hazards		
Acute oral toxicity	Category 4 (H302)	

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Category 1 B (H314)

Category 3 (H335)

Skin Corrosion/Irritation Specific target organ toxicity - (single exposure)

Environmental hazards

Based on available data, the classification criteria are not met

Full text of Hazard Statements: see section 16

2.2. Label elements



Signal Word

Danger

Hazard Statements

H225 - Highly flammable liquid and vapor

- H260 In contact with water releases flammable gases which may ignite spontaneously
- H302 Harmful if swallowed

H314 - Causes severe skin burns and eye damage

H335 - May cause respiratory irritation

EUH019 - May form explosive peroxides

EUH014 - Reacts violently with water

Precautionary Statements

P280 - Wear eye protection/ face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P302 + P335 + P334 - IF ON SKIN: Brush off loose particles from skin. Immerse in cool water

P261 - Avoid breathing dust/fume/gas/mist/vapors/spray

P233 - Keep container tightly closed

P402 + P404 - Store in a dry place. Store in a closed container

2.3. Other hazards

Reacts violently with water

This product does not contain any known or suspected endocrine disruptors

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Component	CAS No	EC No	Weight %	GHS Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567
Methyltetrahydrofuran	96-47-9	202-507-4	60-70	Flam. Liq. 2 (H225) Acute Tox. 4 (H302) Skin Irrit. 2 (H315)

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				Eye Dam. 1 (H318) EUH019
Bromo(1-methylethyl)magnesium	920-39-8	EEC No. 213-056-8	30-40	Water-react. 1 (H260) Skin Corr. 1B (H314) Eye Dam. 1 (H318) (EUH014)

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.
Ingestion	Do NOT induce vomiting. Call a physician or poison control center immediately.
Inhalation	Remove to fresh air. If breathing is difficult, give oxygen. 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. Immediate medical attention is required.
Self-Protection of the First Aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.
4.2. Most important symptoms and	effects, both acute and delayed
	Difficulty in breathing. Causes burns by all exposure routes. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting
4.2. Indication of any immediate ma	diast attention and succial treatment needed

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically. Symptoms may be delayed.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media

Use:. approved class D extinguishers. Water mist may be used to cool closed containers.

Extinguishing media which must not be used for safety reasons Water.

5.2. Special hazards arising from the substance or mixture

Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Reacts violently with water. Produce flammable gases on contact with water.

Isopropylmagnesium bromide, 3M solution in 2-Methyltetrahydrofuran

Hazardous Combustion Products

Isopropane, Hydrogen bromide, Magnesium oxides, Carbon monoxide (CO), Carbon dioxide (CO2).

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment as required. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas. Remove all sources of ignition. Take precautionary measures against static discharges.

6.2. Environmental precautions

Should not be released into the environment. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Do not expose spill to water.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Use only under a chemical fume hood. Wear personal protective equipment/face protection. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. Do not allow contact with water. If peroxide formation is suspected, do not open or move container. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Use spark-proof tools and explosion-proof equipment. Avoid contact with skin, eyes or clothing. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid ingestion and inhalation.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities

Flammables area. Corrosives area. Keep under nitrogen. Keep away from heat, sparks and flame. Store at room temperature. Keep container tightly closed in a dry and well-ventilated place. Keep away from water or moist air. Containers should be dated when opened and tested periodically for the presence of peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals.

Technical Rules for Hazardous Substances (TRGS) 510 Class 4.3 Storage Class (LGK) (Germany)

ALFAAH54840

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7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies

Biological limit values

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)

See table for values

Component	Acute effects local (Dermal)	Acute effects systemic (Dermal)	Chronic effects local (Dermal)	Chronic effects systemic (Dermal)
Methyltetrahydrofuran		DNEL = 30.5228mg/kg		DNEL = 30.5228mg/kg
96-47-9 (60-70)		bw/day		bw/day

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)
Methyltetrahydrofuran 96-47-9 (60-70)		DNEL = 200.196mg/m ³		DNEL = 200.196mg/m ³

Predicted No Effect Concentration (PNEC)

See values below.

8.2. Exposure controls

Engineering Measures

Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting equipment.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection Goggles (European standard - EN 166)

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Nitrile rubber	See manufacturers	-	EN 374	(minimum requirement)
Viton (R)	recommendations			

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves.

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(Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Respiratory Protection	When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly
Large scale/emergency use	Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced Recommended Filter type: Organic gases and vapours filter Type A Brown conforming to EN14387
Small scale/Laboratory use	Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. Recommended half mask:- Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141 When RPE is used a face piece Fit Test should be conducted
Environmental exposure controls	No information available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical StateLiquidAppearanceBrownOdorNo information availableOdor ThresholdNo data availableMelting Point/RangeNo data availableSoftening PointNo data availableBoiling Point/Rangeapprox 80 °C / 176 °FFlammability (liquid)Highly flammableFlammability (solid,gas)Not applicableExplosion LimitsNo data availableFlash Point-11 °C / 12.2 °FAutoignition TemperatureNo data availablePHNo data availableViscosityNo data availableViscosityNo data availableWater SolubilityReacts violently with waterSolubility in other solventsNo information availablePartition Coefficient (n-octanol/water)No data availableVapor PressureNo data available
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Partition Coefficient (n-octanol/water) Vapor Pressure No data available
Vapor Pressure No data available
Density / Specific Gravity 1.08
Bulk Density Not applicable Liquid
Vapor Density No data available (Air = 1.0)
Particle characteristics Not applicable (liquid)
9.2. Other information
Explosive Properties Vapors may form explosive mixtures with air
Substances/mixtures which, in Emitted gas ignites spontaneously
contact with water, emit flammable Gas(es) = Isopropane
gases

IsopropyImagnesium bromide, 3M solution in 2-Methyltetrahydrofuran

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity	Yes
10.2. Chemical stability	Moisture sensitive. Reacts violently with water.
10.3. Possibility of hazardous react	ions
Hazardous Polymerization Hazardous Reactions	No information available. Reacts violently with water. May form explosive peroxides.
10.4. Conditions to avoid	Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition. Exposure to moist air or water.
10.5. Incompatible materials	Water. Acids. Oxidizing agent.

10.6. Hazardous decomposition products

Isopropane. Hydrogen bromide. Magnesium oxides. Carbon monoxide (CO). Carbon dioxide (CO₂).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Product Information	No acute toxicity information is available for this product
(a) acute toxicity; Oral Dermal Inhalation	Category 4 Based on available data, the classification criteria are not met Based on available data, the classification criteria are not met

Toxicology data for the components

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation	
Methyltetrahydrofuran	300-2000 mg/kg (Rat)	4500 mg/kg(Rabbit)	6000 ppm (Rat) 4 h	

(b) skin corrosion/irritation;	Category 1 B
(c) serious eye damage/irritation;	No data available
(d) respiratory or skin sensitization; Respiratory Skin	No data available No data available
(e) germ cell mutagenicity;	No data available
(f) carcinogenicity;	No data available
	There are no known carcinogenic chemicals in this product

IsopropyImagnesium bromide, 3M solution in 2-Methyltetrahydrofuran

(g) reproductive toxicity;	No data available
(h) STOT-single exposure;	Category 3
Results / Target organs	Respiratory system.
(i) STOT-repeated exposure;	No data available
Target Organs	No information available.
(j) aspiration hazard;	No data available
Symptoms / effects,both acute and delayed	Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

11.2. Information on other hazards

Endocrine Disrupting Properties	Assess endocrine disrupting properties for human health.	This product does not contain any
	known or suspected endocrine disruptors.	

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity Ecotoxicity effects

Do not empty into drains. Reacts with water so no ecotoxicity data for the substance is available.

Component	Freshwater Fish	Water Flea	Freshwater Algae
Methyltetrahydrofuran	LC50 (96h) > 100 mg/l	Chronic NOEC >=120 mg/l (21	NOEC >= 104 mg/l (72h)
	Onchorhynchus mykiss (Rainbow	days, Daphnia magna)	EC50 > 104 mg/l (72h)
	trout)		

12.2. Persistence and degradabili Persistence	Persistence is unlikely, based o	n information available.
Degradability	Reacts with water.	
Comp	onent	Degradability
	hydrofuran (60-70)	(2%) 28 days
Degradation in sewage treatment plant	Reacts violently with water.	
12.3. Bioaccumulative potential	Bioaccumulation is unlikely	
<u>12.4. Mobility in soil</u>	•	ganic compounds (VOC) which will evaporate easily from all the environment due to its volatility. Disperses rapidly in
<u>12.5. Results of PBT and vPvB</u> assessment	Reacts violently with water.	

IsopropyImagnesium bromide, 3M solution in 2-Methyltetrahydrofuran

12.6. Endocrine disrupting properties Endocrine Disruptor Information

<u>12.7. Other adverse effects</u> Persistent Organic Pollutant Ozone Depletion Potential

This product does not contain any known or suspected substance This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues/Unused Products	Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.
Contaminated Packaging	Dispose of this container to hazardous or special waste collection point. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.
European Waste Catalogue (EWC)	According to the European Waste Catalog, Waste Codes are not product specific, but application specific.
Other Information	Waste codes should be assigned by the user based on the application for which the product was used. Do not flush to sewer. Can be landfilled or incinerated, when in compliance with local regulations. Do not empty into drains.

SECTION 14: TRANSPORT INFORMATION

14.1. UN number	UN3399
14.2. UN proper shipping name	Organometallic substance, liquid, water-reactive, flammable (Mixture)
Technical Shipping Name	Methyltetrahydrofuran, Bromo(1-methylethyl)magnesium
14.3. Transport hazard class(es)	4.3
Subsidiary Hazard Class	3
14.4. Packing group	I
ADR	
<u>14.1. UN number</u>	UN3399
<u>14.2. UN proper shipping name</u>	Organometallic substance, liquid, water-reactive, flammable (Mixture)
Technical Shipping Name	Methyltetrahydrofuran, Bromo(1-methylethyl)magnesium
<u>14.3. Transport hazard class(es)</u>	4.3
Subsidiary Hazard Class	3
<u>14.4. Packing group</u>	I
ΙΑΤΑ	
<u>14.1. UN number</u>	UN3399
<u>14.2. UN proper shipping name</u>	Organometalic substance, liquid, water-reactive, flammable (Mixture)
Technical Shipping Name	Methyltetrahydrofuran, Bromo(1-methylethyl)magnesium
<u>14.3. Transport hazard class(es)</u>	4.3
Subsidiary Hazard Class	3
<u>14.4. Packing group</u>	I

IMDG/IMO

IsopropyImagnesium bromide, 3M solution in 2-Methyltetrahydrofuran

14.5. Environmental hazards No hazards identified

14.6. Special precautions for user No special precautions required.

14.7. Maritime transport in bulk according to IMO instruments Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

Component	CAS No	EINECS	ELINCS	NLP	IECSC	TCSI	KECL	ENCS	ISHL
Methyltetrahydrofuran	96-47-9	202-507-4	-	-	Х	Х	KE-33479	-	Х
Bromo(1-methylethyl)magnesium	920-39-8	213-056-8	-	-	-	Х	-	-	-

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	DSL	NDSL	AICS	NZIoC	PICCS
Methyltetrahydrofuran	96-47-9	Х	ACTIVE	Х	-	Х	Х	Х
Bromo(1-methylethyl)magnesium	920-39-8	Х	ACTIVE	-	X	-	-	-

Legend: X - Listed '-' - Not Listed

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

Authorisation/Restrictions according to EU REACH

Not applicable

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization		REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Methyltetrahydrofuran	96-47-9	-	-	-
Bromo(1-methylethyl)magnesium	920-39-8	-	-	-

Seveso III Directive (2012/18/EC)

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Methyltetrahydrofuran	96-47-9	Not applicable	Not applicable
Bromo(1-methylethyl)magne	920-39-8	Not applicable	Not applicable
sium			

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals

Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)? Not applicable

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work .

Isopropylmagnesium bromide, 3M solution in 2-Methyltetrahydrofuran

National Regulations

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification

Water endangering class = 2 (self classification)

Component	Germany - Water Classification (AwSV)	Germany - TA-Luft Class
Methyltetrahydrofuran	WGK2	
Bromo(1-methylethyl)magnesium	WGK1	

15.2. Chemical safety assessment

Chemical Safety Assessment/Reports (CSA/CSR) are not required for mixtures

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3

H225 - Highly flammable liquid and vapor

H260 - In contact with water releases flammable gases which may ignite spontaneously

H302 - Harmful if swallowed

H314 - Causes severe skin burns and eye damage

H315 - Causes skin irritation

H318 - Causes serious eye damage

EUH014 - Reacts violently with water

EUH019 - May form explosive peroxides

Legend

CAS - Chemical Abstracts Service	TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances PICCS - Philippines Inventory of Chemicals and Chemical Substances IECSC - Chinese Inventory of Existing Chemical Substances KECL - Korean Existing and Evaluated Chemical Substances	y
WEL - Workplace Exposure Limit ACGIH - American Conference of Governmental Industrial Hygienists DNEL - Derived No Effect Level RPE - Respiratory Protective Equipment LC50 - Lethal Concentration 50% NOEC - No Observed Effect Concentration PBT - Persistent, Bioaccumulative, Toxic	 TWA - Time Weighted Average IARC - International Agency for Research on Cancer Predicted No Effect Concentration (PNEC) LD50 - Lethal Dose 50% EC50 - Effective Concentration 50% POW - Partition coefficient Octanol:Water vPvB - very Persistent, very Bioaccumulative
ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code	ICAO/IATA - International Civil Aviation Organization/International Air Transport Association MARPOL - International Convention for the Prevention of Pollution from Ships

OECD - Organisation for Economic Co-operation and Development BCF - Bioconcentration factor

Key literature references and sources for data https://echa.europa.eu/information-on-chemicals

ATE - Acute Toxicity Estimate VOC - (Volatile Organic Compound)

IsopropyImagnesium bromide, 3M solution in 2-Methyltetrahydrofuran

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:		
Physical hazards	On basis of test data	
Health Hazards	Calculation method	
Environmental hazards	Calculation method	

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts. Chemical incident response training.

Prepared By	Health, Safety and Environmental Department
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Revision Summary	Not applicable.

This safety data sheet complies with Regulation UK SI 2019/758 and UK SI 2020/1577 as amended.

Disclaimer

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End of Safety Data Sheet