

Safety Data Sheet



Product name:

Moleculite[®]

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Issue: I

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Compiled in accordance with REACH Regulation (EC) No 1907/2006, as amended by UK REACH Regulations SI 2019/758
Prepared according to GB CLP which is the retained CLP Regulation (EU) No 1272/2008, as amended for Great Britain

SECTION 1		IDENTIFICATION OF SUBSTANCE / PREPARATION AND OF THE COMPANY
1.1	Product identifier	Moleculite (the reaction mass of copper oxide and manganese dioxide) EC 910-356-7 REACH reg. no. 0.-2120746889-31-XXXX
	Unique Formula Identifier (UFI)	Not applicable
1.2	Relevant identified uses of the substance or mixture and uses advised against	Relevant identified uses: As a remover of contaminants from breathable gases by catalytic oxidation Uses advised against: No data Reason why uses advised against: No data
1.3	Details of the supplier of the safety data sheet	Molecular Products Ltd Parkway, Harlow Business Park, Harlow, Essex, CM19 5FR, UK +44 (0)1279 445111 (I) sds@molprod.com (I) Only available during office hours 0900 – 1700 GMT
1.4	Emergency telephone number	+44 (0) 1279 445111 (office hours) +44 (0)1865 407333 (out of hours, English speaking) China (NRCC): +86 532 8388 9090, Mexico: +52 555 004 8763, Chile: +56 225 829 336, Brazil: +55 11 3197 5891

SECTION 2		HAZARDS IDENTIFICATION		
2.1	Classification of the substance or mixture			
2.1.1	Classification according to Regulation (EC) No 1272/2008 (CLP/GHS)			
	Acute Tox. 4	H302	Aquatic Chronic 1	H410
	Acute Tox. 4	H332		
	STOT RE. .2	H373		
2.1.2	See section 16 for full text of H statements			
2.2	Labelling elements			
2.2.1	Labelling in accordance with EC Regulation No 1272/2008 (CLP/GHS)			
	Pictogram			Signal word WARNING
	Hazard statements			
	* Please note that the Moleculite is encased within the Hi-Cap and Marcisorb CO Absorber units and only minimal amounts of dust will be present when in use.			
	H302	Harmful if swallowed		
	H332	Harmful if inhaled		
	H373	May cause damage to brain through prolonged or repeated exposure via inhalation *		
	H410	Very toxic to aquatic life with long lasting effects		
	Precautionary statements			
	P261	Avoid breathing dust/fume/gas/mist/vapours/spray.		
	P270	Do not eat, drink or smoke when using this product		
	P273	Avoid release into the environment		
	P260	Call a POISON CENTER or doctor/physician if you feel unwell		
	P391	Collect spillage.		
	P501	Dispose of contents/container to authorised recipient of hazardous waste		
2.3	Other hazards			

	The product does not meet the PBT or vPvB criteria. The criteria of Annex XIII to the Regulation 1907/2008/EC (PBT or vPvB) does not apply to inorganic substances
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS						
	Chemical characterisation	Transition metal oxides				
	Chemical name	CAS number	EC no.	REACH reg. no.	Classification	Concentration
	Manganese Dioxide	1313-13-9	215-202-6	-	Acute Tox 4 H302 Acute Tox 4 H332 STOT RE 2; H373 (brain) (inhalation)	60-80%
	Copper oxide	1317-38-0	215-269-1	-	Aquatic Acute 1 H400 Aquatic Chronic 1 H410 (M=100)	≤ 40%

SECTION 4 FIRST AID MEASURES		
4.1	Description of measures	
	Inhalation	Remove casualty to fresh air and provide warmth and rest. Seek medical attention if you feel unwell
	Skin contact	Immediately remove contaminated clothing. Flush contaminated skin with plenty of water with soap and more water. Seek medical advice if necessary
	Eye contact	Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Avoid strong stream of water due to the risk of mechanical damage to the cornea. Seek medical advice if necessary
	Ingestion	Do NOT induce vomiting. Rinse mouth out with water and then drink plenty of water. Seek medical advice if necessary
4.2	Most important effects/symptoms both acute and delayed	
	Inhalation	Persons exposed to high levels of the product are susceptible to respiratory diseases. The repeated inhalation of dust may cause damage to the central nervous system. Harmful if inhaled
	Eye contact	Significant concentrations of dust or direct ingress of substances into the eyes may cause irritation, redness, tearing, burning and conjunctivitis
	Skin contact	May cause irritation, redness, dryness, itching and inflammation
	Ingestion	May cause irritation of the mucous membrane of the digestive tract and stomach, nausea, vomiting diarrhoea and stomach pain. Harmful if swallowed
4.3	Immediate/special treatment	
		Remove affected person from the contaminated product. In the event of health problems, immediately consult your doctor or a centre of toxicological concern. Provide the information contained in the SDS. If unconscious do not give anything by mouth

Section 5 FIRE FIGHTING MEASURES		
5.1	Extinguishing media	To suit local surroundings (e.g. chemical powder, carbon dioxide and dry sand).
	Unsuitable media	Water jet
5.2	Special hazards	Avoid inhalation of combustion products
5.3	Advice for fire fighters	Wear full protective equipment and self-contained breathing apparatus. If containers are exposed to high temperatures cool with water and if possible, remove from area. Take up mechanically. Keep out of drains, surface water and soil. Place water waste in containers and dispose of contents/container to authorised recipient of hazardous waste

Section 6 ACCIDENTAL RELEASE MEASURES		
6.1	Personal precautions	Adhere to personal protective measures. Avoid inhalation of dust
6.2	Environmental precautions	Do not allow to get into wastewater or waterways; if this occurs, inform the relevant water authority at once
6.3	Methods and materials for cleaning up	In the event of spillage, take up mechanically avoiding the formation of dust (e.g. sweep or vacuum up) into tightly closed containers. Label container and dispose of contents/container to authorised recipient of hazardous waste
6.4	Reference to other sections	See section 8 for personal protective equipment

Section 7 HANDLING AND STORAGE		
7.1	Precautions for safe handling	Handle in accordance with good hygiene and safety practice. Avoid the raising and deposition of dust
7.2	Conditions for safe storage	Ensure adequate ventilation of the storage area. Keep containers tightly closed, cool and dry, avoiding direct sunlight
7.3	Specific end use(s)	As a remover of contaminates from breathable gases and as a catalyst

Section 8	SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION								
8.1	Workplace Exposure Limits (WELs) have been assigned by the HSE (EH40/2020) for solid material.								
	LTEL (8 hours)	ppm	0.2		mg/m ³	Inhalable dust			
	LTEL (8 hours)	ppm	0.05		mg/m ³	Respirable dust			
	Substance name	Manganese dioxide							
	EC number	215-202-6		CAS number	1313-13-9				
	DNELs								
		Workers				Consumers			
	Route of exposure	Acute effect local	Acute effects systemic	Chronic effects local	Chronic effects systemic	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic
	Oral	Not required				No data	No hazard identified	No data	No threshold effect
	Inhalation	No hazard identified	No hazard identified	No hazard identified	0.2 mg/m ³	No hazard identified	No threshold effect	No hazard identified	0.043 mg/m ³
	Dermal	No threshold effect	No threshold effect	No threshold effect	0.004 mg/kg bw/day	No threshold effect	No threshold effect	No hazard identified	0.002 mg/kg bw/day
	PNECs								
	Environmental protection target				PNEC				
	Fresh water				0 mg/L				
	Freshwater sediments				0.0037 mg/kg				
	Marine water				0 mg/L				
	Marine sediments				0.004 mg/kg				
	Food chain				No potential for bioaccumulation				
	Microorganisms in sewage treatment				100 mg/L				
	Soil (agriculture)				0.028 mg/kg				
	Air				No hazard identified				
	Substance name	Copper oxide							
	EC number	215-269-1		CAS number	1317-38-0				
	DNELs								
		Workers				Consumers			
	Route of exposure	Acute effect local	Acute effects systemic	Chronic effects local	Chronic effects systemic	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic
	Oral	Not required				No data	0.082 mg/kg bw/day	No data	0.041 mg/kg/bw/day
	Inhalation	No hazard identified	No hazard identified	1 mg/m ³	1 mg/m ³	No hazard identified	No hazard identified	No hazard identified	No hazard identified
	Dermal	No hazard identified	No hazard identified	No hazard identified	137 mg/kg bw/day	No hazard identified	No hazard identified	No hazard identified	No hazard identified
	PNECs								
	Environmental protection target				PNEC				
	Fresh water				7.8 µg/L				
	Freshwater sediments				87 mg/kg sediment dw				
	Marine water				5.2 µg/L				
	Marine sediments				676 mg/kg sediment dw				
	Food chain				No potential for bioaccumulation				
	Microorganisms in sewage treatment				230 µg/L				
	Soil (agriculture)				65 mg/kg soil dw				
	Air				No hazard identified				
8.2	Exposure controls								
	Engineering controls	Mandatory general regulations on occupational health. For hazardous constituents, do not allow the environmental and workplace concentration limits to exceed values stated above. Ensure that exposed skin is washed and contaminated clothing is disposed of /cleaned if reused. Do not eat, drink, or smoke. Avoid skin and eye contact, wash hands and face before and after working with the product. Avoid inhalation of dust and provide adequate local and general ventilation							
	Personal protection	Observe normal standards for handling chemicals Wash hands before breaks and after work Avoid inhalation of dust if raised Wear personal protective equipment appropriate to the task (see below)							

	Eye protection	Wear suitable protective glasses/goggles e.g. Polycarbonate (EN 166)
	Skin protection	Wear protective chemical resistant gloves (EN 374, PVC, thickness 1.5mm) break through time <480 mins
	Respiratory protection	Wear approved dust mask or respirator with filter APF 10/APF 20
	Other protection	Protective overalls. Concentrations of hazardous substances should be monitored in accordance with recognised test methods. Mode, method, type and frequency of testing (measurement of harmful factors) should meet the requirements of local/regional/national laws
	Environmental exposure	Do not introduce the product to ground water, sewage, wastewater, or soil

Section 9		PHYSICAL AND CHEMICAL PROPERTIES		
9.1	Basic physical and chemical properties			
	Physical form	Solid (mesh: 4-8; 8-14)	Colour	Brown-black
	Odour	Odourless	pH	7.9
	Boiling point/range	Not applicable	Melting point/range	>500°C
	Flash point	Not applicable	Bulk density	700 – 900 kg/m ³
	Water solubility	350 mg/L at 20°C	Odour threshold	Not applicable, odourless
	Evaporation rate	Negligible	Flammability	Inflammable
	Explosion limits	Not applicable	Vapour pressure	Not applicable
	Vapour density	Not applicable as product is a solid	Partition coeff. LogP _{oct} /water	Not applicable, raw materials are inorganic substances
	Auto-ignition temperature	>420°C	Viscosity	Not applicable as product is a solid
	Explosive properties	Not applicable	Oxidising properties	According to the UN-Test 0.1 (RL2; 2011) there is no classification requirement
	Decomposition temperature	704°C		
9.2	Other information	Resistance layer: Not less than 30mm H ₂ O	Mechanical strength: Not less than 73%	Dynamic activity against carbon monoxide: Not less than 50 minutes

Section 10		STABILITY AND REACTIVITY	
10.1	Reactivity	Stable under normal conditions of handling. Moleculite is hygroscopic	
10.2	Chemical stability	Stable under normal conditions of handling. Moleculite is hygroscopic	
10.3	Hazardous reactions	Hazardous polymerisation will not occur	
10.4	Conditions to avoid	Moisture and very high temperatures. Loses catalytic activity when heated above 200°C	
10.5	Incompatible materials	Risk of explosion in contact with azides, chlorates, oxidising and reducing agents, hydrogen peroxide, flammable substances. Exothermic reactions from aluminium, strong acids and bases and phosphides, hydrogen sulphide, alkali metals and powdered metals. Heating results in oxidation of carbon to carbon dioxide and water and the reduction of copper oxide to metallic copper	
10.6	Hazardous decomposition products	If heated above the decomposition temperature oxides of Manganese and Copper are released	

Section 11		TOXICOLOGICAL INFORMATION					
11.1	Information on hazard classes as defined in Regulation (EC) No 1272/2008						
	Hazard class	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	Acute toxicity	LD ₅₀	Rat	oral	None	Data for manganese dioxide/copper oxide reaction mass	>2000 mg/kg b.w.
		LD ₅₀	Rat	oral	None	Data for manganese dioxide	>2000 mg/kg
		LD ₅₀	Rat	oral	None	Data for copper oxide	>2500 mg/kg
		LD ₅₀	Rat	oral	None	value calculated based on the ratio of MnO ₂ and CuO in the reaction mass	>2850 mg/kg b.w. (female),
		LD ₅₀	Rat	dermal	None		>2000 mg/kg b.w.
	Skin corrosion/irritation	Not classified					
	Serious eye damage/irritation	Not classified					
	Respiratory or skin sensitisation	Not classified					
	Germ cell mutagenicity	Not classified					

	Carcinogenicity	Not classified
	Reproductive toxicity	Not classified
	Summary of evaluation of the CMR properties	Not classified
	STOT-single exposure	Not classified
	STOT-repeated exposure	Classified in terms of specific target organ toxicity (brain) after repeated inhalation exposure STOT RE 2, H373.
	Aspiration hazard	Not classified
11.2	Information on other hazards	
	No information	

Section 12		ECOLOGICAL INFORMATION			
12.1	Toxicity to aquatic algae	LC ₅₀	(72h; green algae); <i>Desmodesmus subspicatus</i>	>143mg/L	OECD 201
	Toxicity to bacteria	LC ₅₀	(48h; bacteria) <i>Escherichia Coli WP uvr A</i>	1250µg	OECD 471
12.2	Persistence and degradability	Hydrolysis	According to section 1 of Annex XI REACH regulation, study is not needed as product is an inorganic substance	No data	No data
12.3	Bio-accumulative potential	No relevant information available	No data	No data	No data
12.4	Mobility in soil	KP (soil): 2363 L/kg	No data	No data	No data
12.5	PBT/vPvB assessment	The product does not meet the criteria according to REACH Annex XIII as the product is an inorganic substance	No data	No data	No data
12.6	Other adverse effects	Hazard assessment for secondary poisoning	According to the evaluation of the EU assessment report on copper oxide (directive 98/8/EC concerning the placing of biocidal on the market, copper (II) oxide, 2011, France) bioaccumulation and bio-magnification did not apply for the constituent copper oxide of the submission substance. For the constituent manganese dioxide, the OECD SIDS report on manganese dioxide reported that manganese significantly bio-concentrated in lower organisms but showed small bio-concentration in fish, indicating that manganese has a very low potential to accumulate in the food chain. In conclusion, no hazard due to secondary poisoning for the submission substance was anticipated.		

Section 13		DISPOSAL CONSIDERATIONS	
13.1	Product/ Packaging disposal	If possible, recycle to supplier or approved recycling company. If not (e.g. designated as waste), dispose of in accordance with national and local authority regulations, e.g. The Hazardous Waste (England & Wales) Regulations 2005. Material is a special waste under UK legislation. Treat empty containers in the same way as the product. If possible, wash out thoroughly and recycle	
	Waste treatment-relevant information	Do not introduce into the environment. Collect effluent into containers and send to qualified disposal company in labelled containers. Contaminated packaging must be disposed of as dangerous waste material	
	Sewage disposal-relevant information	No data	
	Other disposal recommendations	Contaminated packaging, dispose of as unused product.	

Section 14		TRANSPORT INFORMATION			
14.1	United Nations number (ADR, IMDG, IATA)	UN 3077	14.2	Proper shipping name (ADR, IMDG, IATA)	Environmentally hazardous substance, solid, n.o.s. (contains copper (II) oxide)
14.3	Transport class(s) (ADR, IMDG, IATA)	9 (exempt when < 5kg is shipped in packaging ADR 3.4)	14.4	Packing group (ADR, IMDG, IATA)	III (exempt when ≤5kg is shipped in packaging ADR 3.4)
14.5	Environmental hazards (ADR, IMDG, IATA)	Toxic to the environment in accordance with UN model regulations	14.6	Special procedures (ADR, IMDG, IATA)	No special recommendation
14.7	Transport in bulk	Not applicable			

Section 15		REGULATORY INFORMATION	
15.1	Safety, health and environmental regulations	The SDS has been updated in accordance with EC Regulation No 1272/2008 (CLP/GHS/REACH Annex II), Regulation EC 1907/2006, Commission regulation EU No 2015/830, Directive 2008/98/EC and European Parliament and Council Directive 94/62/EC	
15.2	Chemical safety assessment	Has been performed for the mixture	

Section 16		OTHER INFORMATION	
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