Safety Data Sheet

Product name:

Oxygen Generator

Document N°: LB01-00405
Issue: 2
Revision date: 14 March 2022

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

1	SECTION 1: IDENTIFICATION OF SUBSTANCE / PREPARATION AND OF THE COMPANY	
1.1	Product identifier	Substance name: Oxygen generator (ROG / eMPOG)
	Unique Formula Identifier (UFI)	XH00-W0SR-E007-CGVF
1.2	Relevant identified uses of the substance or mixture and uses advised against	Relevant identified uses: A source of oxygen for life support or industrial applications Uses advised against: Reason why uses advised against:
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 (1) sds@molprod.com (1) Only available during office hours 0900 – 1700 GMT
1.4	Emergency telephone number	+44 (0)1865 407333 (English speaking) +86 0532 8388 9090 (China NRCC)) +52 555 004 8763 (Mexico) +56 225 829 336 (Chile) +55 11 3197 5891 (Brazil)

2	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)				
	Ox Sol 1	H271		Corr. 1B	H314
	Acute Tox. 4	H302		Aquatic Chronic 2	H411
2.1.2	Additional information – see section 16 for full text of H statements				
2.2	Label elements				
2.2.1	Labelling in accordance with EC Regulation No 1272/2008 (CLP/GHS)				
	Pictogram(s)		Signal word	DANGER	
	Hazard statements				
	H271	May cause fire or explosion; strong oxidiser			
	H302	Harmful if swallowed			
	H314	Causes severe skin burns and eye damage			
	H411	Toxic to aquatic life with long lasting effects			
	Precautionary statements				
	P220	Keep/store away from organic and combustible materials.			
	P270	Do not eat, drink, or smoke when using this product			
	P273	Avoid release to the environment			
	P301 + P312	If swallowed: call a poison centre or doctor/physician if you feel unwell			
	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.			
	P371 + P380 + P375	In case of fire: evacuate area. Fight fire remotely due to the risk of explosion			
	Supplemental Hazard information (EU)	No data			
2.3	Other hazards				
	None known				

3	SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS							
3.2	Mixtures							
	Chemical characterisation	Mixture of inorganic substances						
	Chemical name	CAS No.	Index No.	REACH registration No.	EC No.	Classification according to Regulation (EC) No 1278/2008 (CLP)	% [weight]	SCL, M-factor, ATE
	Sodium Chlorate	7775-09-9	017-005-00-9	01-2119474389-23-XXXX	231-887-4	Ox Sol. 1 H271, Acute Tox. 4 H302 Aquatic Chronic 2 H411	>85%	No data
	Barium Peroxide	1304-29-6	056-001-00-1	01-2120772609-41-XXXX	215-128-4	Ox Sol. 2 H272 Acute Tox. 4 H332 Acute Tox. 4 H302	<4%	No data
	Phosphorous (red)*	7723-14-0	015-002-00-7	01-2119448009-39-XXXX	231-768-7	Flam Sol. 1 H228, Aquatic Chronic 3 H412	<0.1%	No data

*This has a different classification and EC number to white phosphorus

4	SECTION 4: FIRST AID MEASURES	
4.1	Description of first aid measures	
	General notes	
	Following inhalation	Remove casualty to fresh air and provide warmth and rest
	Following skin contact	Clean areas of skin affected immediately with soap and plenty of water. If necessary, seek medical advice
	Following eye contact	Immediately wash out eye thoroughly with plenty of water until irritation subsides. If necessary, consult an eye specialist/ophthalmologist
	Following ingestion	If swallowed, do NOT induce vomiting. Drink plenty of water and, if necessary, seek medical advice
	Self-protection of the first aider	If the atmosphere is dusty ensure that there is sufficient LEV or suitable respiratory protective equipment is used.
4.2	Most important symptoms and effects, both acute and delayed	None known
4.3	Indication of any immediate medical attention and special treatment needed	Treatment as described above. Risk of methaemoglobinemia. Not to be treated with methylthionin.

5	SECTION 5: FIREFIGHTING MEASURES	
5.1	Extinguishing media	Suitable extinguishing media: Flood with water. Unsuitable extinguishing media: Do NOT use foam
5.2	Special hazards arising from the substance or mixture	Liberates oxygen if heated above 300°C. May cause fire or an explosion if in contact with combustible materials Hazardous combustion products: No data
5.3	Advice for fire fighters	Self-contained breathing apparatus may be required. Use water spray to cool fire-exposed containers

6	SECTION 6: ACCIDENTAL RELEASE MEASURES	
6.1	Personal precautions, protective equipment and emergency procedures	For non-emergency personnel: - Protective equipment: Adhere to personal protective measures - Emergency procedures: No data For emergency responders: Adhere to personal protective measures
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 containment and cleaning up	For containment: No data For cleaning up: In the event of spillage, take up large and small fragments mechanically (e.g. sweep or vacuum up, small fragments being first treated with damp sand) into tightly closed containers. Adhere to personal protective measures. Label container and dispose of as prescribed. Do NOT sweep up dry dust (possibility of explosion) Other information: No data
6.4	Reference to other sections	See section 8 for personal protective equipment

7	SECTION 7: HANDLING AND STORAGE	
7.1	Precautions for safe handling	Protective measures: Handle in accordance with good hygiene and safety practice. Avoid the raising and deposition of dust Measures to prevent fire: No data Measures to prevent aerosol and dust generation: No data Measures to protect the environment: No data Advice on general occupational hygiene: No data
7.2	Conditions for safe storage, including any incompatibilities	Technical measures and storage: No data Packaging materials: No data Requirements for storage rooms and vessels: Ensure adequate ventilation of the storage area. Keep containers tightly closed, cool and dry, avoiding direct sunlight and away from organic combustible materials and strong acids Storage class: No data
7.3	Specific end use(s)	Recommendations: See section 1.2 Industrial sector specific solutions

8	SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION				
8.1	Workplace Exposure Limits (WELs) have been assigned by the HSE (EH40/2005)				
	TWA (8 hours)	ppm	0.5	mg/m^3	Barium compounds (soluble)
	TWA (8 hours)	ppm	0.1	mg/m^3	Data for phosphorous
	STEL (15 mins)	ppm	0.3	mg/m^3	Data for phosphorous

	Substance name	Sodium Chlorate		
	EC number	231-887-4	CAS number	7775-09-9

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 hazard identified	No hazard identified	No hazard identified	0.05mg/kg bw /day
	Inhalation	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	5 mg/m^3
	Dermal	No hazard identified	No hazard identified	No hazard identified	3.08 mg/kg bw/day	No hazard identified	No hazard identified	No hazard identified	0.05 mg/kg bw/day

PNECs

Environmental protection target	PNEC
Fresh water	1 mg/L
Freshwater sediments	No hazard identified
Marine water	1 mg/L
Marine sediments	No hazard identified
Food chain	0.01 g/kg food
Microorganisms in sewage treatment	100 mg/L
Soil (agriculture)	3.33 mg/kg soil dw
Air	No hazard identified

	Substance name	Barium Peroxide		
	EC number	215-128-4	CAS number	1304-29-6

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 data	No data	No data
	Inhalation	No data	No data	No data	No data	No data	No data	No data	No data
	Dermal	No data	No data	No data	No data	No data	No data	No data	No data

PNECs

Environmental protection target	PNEC
Fresh water	No data
Freshwater sediments	No data
Marine water	No data
Marine sediments	No data

	Food chain					No data			
	Microorganisms in sewage treatment					No data			
	Soil (agriculture)					No data			
	Air					No data			
	Substance name	Phosphorous (red) in ignite only							
	EC number	231-768-7			CAS number	7723-14-0			
	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	No data	No data	No data
	Inhalation	No data	No data	No data	No data	No data	No data	No data	No data
	Dermal	No data	No data	No data	No data	No data	No data	No data	No data
	PNECs								
	Environmental protection target					PNEC			
	Fresh water					No data			
	Freshwater sediments					No data			
	Marine water					No data			
	Marine sediments					No data			
	Food chain					No data			
	Microorganisms in sewage treatment					No data			
	Soil (agriculture)					No data			
	Air					No data			
8.2	Exposure controls								
	Appropriate engineering controls	Substance/mixture related measures to prevent exposure during identified uses: No data Structural measures to prevent exposure: Provide adequate ventilation (e.g. local exhaust ventilation) Organisational measures to prevent exposure: No data Technical measures to prevent exposure: No data							
	Personal protection	Observe normal standards for handling chemicals Wash hands before breaks and after work Avoid contact with skin and eyes. Avoid inhalation of dust if raised Wear personal protective equipment appropriate to the task (see below)							
	Eye and face protection	Safety goggles if risk of eye contamination; BS EN 166:2002							
	Skin protection	Hand protection: Rubber gloves EN ISO 374-1/Type C Other skin protection: Protective overalls such as a disposable paper suit.							
	Respiratory protection	Approved dust mask or respirator (e.g. EN 149:2001 FFP3) for dust if ventilation is insufficient							
	Thermal hazards	The auto-ignition temperature of phosphorus is 30°C							
	Environmental exposure controls	Substance/mixture related measures to prevent exposure: No data Instruction measures to prevent exposure: No data Organisational measures to prevent exposure: No data Technical measures to prevent exposure: No data							

9	SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES			
9.1	Information on basic physical and chemical properties			
	Physical state	Solid	Colour	Grey
	Odour	Odourless	pH	Not determined
	Boiling pt/range	Not determined. Decomposes at approx. 300°C	Melting pt/range	Approx. 200°C
	Flash point	Not applicable	Relative density	2.0g/cm³
	Solubility	Partial	Odour threshold	Not applicable
	Evaporation rate	Not applicable	Flammability	Not applicable
	Lower and upper explosion limit	Not applicable	Vapour pressure	Not applicable
	Relative vapour density	Not applicable	Partition coeff. LogPoct/water	Not applicable
	Auto-ignition temperature	Not applicable	Kinematic viscosity	Not applicable
	Explosive properties	Not determined	Oxidising properties	Not determined
	Decomposition temperature	Not determined	Particle characteristics	Not determined
9.2	Other information	Strong oxidiser		

10	SECION 10: STABILITY AND REACTIVITY	
10.1	Reactivity	Can burn with exploding violence if in contact with fuels or organic material
10.2	Chemical stability	Stable under normal conditions of handling
10.3	Possibility of hazardous reactions	Decomposes to form oxygen on heating or ignition (friction or impact can cause ignition)
10.4	Conditions to avoid	Contact with water and organic materials
10.5	Incompatible material	Organic material
10.6	Hazardous decomposition products	Chlorine and chlorine dioxide can be evolved following contact with strong acids

11	SECTION 11: TOXICOLOGICAL INFORMATION						
11.1	Information on hazard classes as defined in Regulation (EC) No 1272/2008 (results for sodium chlorate)						
	Hazard class	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	Acute toxicity	LD_{50}	Rabbit	Oral	1200 mg/kg	No data	Data for sodium chlorate
	Skin corrosion/irritation	Sodium chlorate is only mildly irritating to skin.					
	Serious eye damage/irritation	Sodium chlorate is only mildly irritating to eyes					
	Respiratory or skin sensitisation	Sodium chlorate is only mildly irritating to the respiratory tract.					
	Germ cell mutagenicity	No adverse effects were observed in the Ames Test.					
	Carcinogenicity	NOAEL 5 mg/kg bw /day female mice 2-year study					
	Reproductive toxicity	NOAEL 70 mg/kg bw/day two generation female mice					
	Summary of evaluation of the CMR properties	Studies show that sodium chlorate shows no indication of CMR properties					
	STOT-single exposure	Despite the low acute toxicity in animals, LD50 5000 mg/kg, sodium chlorate is considered as harmful to humans due to available data on human lethal effects. Sodium chlorate is classified as Acute Tox. 4.					
	STOT-repeated exposure	NOAEL 100 mg/kg bw/day 90-day study. Rat, oral					
	Aspiration hazard	Not classified.					
11.2	Information on other hazards	None					

12	SECTION 12: ECOLOGICAL INFORMATION	
12.1	Toxicity (Sodium chlorate)	
	Acute (short-term) toxicity	Fish: LC50 >1000 mg/L Crustacea: EC50 shell growth >1000 mg/L Algae/aquatic plants: Other organisms: EC50 freshwater invertebrates >1000 mg/L
	Chronic (long-term) toxicity	Fish: NOEC =>500 mg/L Crustacea: Algae/aquatic plants: NOEC 10 mg/L Other organisms: NOEC 500 mg/L *(Daphnia* magna*)*
12.2	Persistence and degradability	Abiotic Degradation: No data Physical- and photo-chemical elimination: Biodegradation: No data
12.3	Bio-accumulative potential	Partition coefficient n-octanol /water (log Kow): log Pow < minus 2.9 at 20°C Bioconcentration factor (BCF): No data
12.4	Mobility in soil	Known or predicted distribution to environmental compartments: No data Surface tension: No data Adsorption/Desorption: No data
12.5	PBT/vPvB assessment	Not applicable
12.6	Endocrine disrupting properties	No data
12.7	Other adverse effects	Risk of damage to plant life. Do not allow to get into wastewater or waterways. If this occurs, inform the relevant water authority at once

13	SECTION 13: DISPOSAL CONSIDERATIONS	
13.1	Waste treatment methods	
	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. Treat empty containers in the same way as the product: if possible, wash out thoroughly and recycle Waste codes/ waste designations according to LoW:
	Waste treatment-relevant information	No data
	Sewage disposal-relevant information	No data
	Other disposal recommendations	No data

14	SECTION 14: TRANSPORT INFORMATION				
14.1	UN number	UN 3356	14.2	UN proper shipping name	Oxygen generator, chemical
14.3	Transport hazard class(es)	5.1 	14.4	Packing group	Not applicable
14.5	Environmental hazards	The product should be marked as a marine pollutant 	14.6	Special precautions for user	Not applicable
14.7	Maritime transport in bulk according to IMO instruments	Not applicable			

15	SECTION 15: REGULATORY INFORMATION
15.1	Safety, health and environmental regulations/legislation specific for the substance or mixture
	The SDS has been updated in accordance with EC Regulation No 1272/2008 (CLP/GHS)
15.2	Chemical safety assessment
	No Chemical Safety Assessment has been carried out for this mixture by the supplier

16	SECTION 16: OTHER INFORMATION		
	Indication of changes	This SDS has been revised in accordance with EC Regulation 1272/2008 (CLP) and in response to a change in Annex II REACH regulations, June 2020.	
	Abbreviations and acronyms	None	
	Key literature references and sources for data	Other suppliers' safety data sheets, Annex VI of the CLP Regulation (EC) No 1272/2008, EH40 (2020)	
	Prepared by	Dr Patricia Wormald, Molecular Products, PW@molprod.com Neil Stearn, Cambridge Environmental Assessments; neil.stearn@cea-res.co.uk	
	Date of issue	30 August 2021	
	Classification according to Regulation (EC) No 1272/2008		Classification procedure
	Ox Sol 1 H271		No data
	Acute Tox. 4 H302		No data
	Skin Corr 1B: H314		No data
	Aquatic Chronic 2 H411		No data
	Relevant H statements (number and full text)	H271: May cause fire or explosion; strong oxidiser H302: Harmful if swallowed H314: Causes severe skin burns and eye damage H411: Toxic to aquatic life with long lasting effects H272: May intensify fire; oxidiser H332: Harmful if inhaled H228: Flammable solid H412: Harmful to aquatic life with long lasting effects	
	Training advice	None	
	Further information	Comply with COSHH Regulations This information is based on our present state of knowledge and is intended to describe our products from the point of view of the safety requirements. It should not be construed as guaranteeing specific problems	