



MAKHRO 2,4-DB

Safety Data Sheet

according to Globally Harmonized System of Classification and Labelling of Chemicals (GHS), 9th Revision (2021) & Regulations for Hazardous Chemical Agents (2021)
Issue date: 29/09/2022 Revision date: 22/09/2022 Version: 2.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : MAKHRO 2,4-DB
Synonyms : 4-(2,4-DICHLOROPHENOXY) BUTYRIC ACID, SODIUM SALT 400G/L AI
Product form : Mixture
Type : Herbicide
Country : South Africa

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category : Industrial use, Professional use
Use of the substance/mixture : Herbicide

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Registration holder :

Makhro-Agro SA (Pty) Ltd.
21 Viben Street
PO Box 498, BRACKENFELL, 7561
Tel nr (021) 982 1460 / Fax nr (021) 982 5810

1.4. Emergency telephone number

Emergency number : Griffon Poison Information Centre +27(0)82 446 8946
Tygerberg Poison Information Centre: +27(0)861 155 5777
SPILL TECH® +27 (0)86 100 0366
+27 (0)83 253 6618

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to the Regulations for Hazardous Chemical Agents, 2021

Acute toxicity (oral), Category 4 H302
Serious eye damage/eye irritation, Category 1 H318
Hazardous to the aquatic environment – Chronic Hazard, Category 2 H411
Full text of H-statements: see section 16

Adverse physicochemical, human health and environmental effects

Harmful if swallowed. Causes serious eye irritation. Toxic to aquatic life with long lasting effects.

2.2. Label elements

Labelling according to Globally Harmonized System of Classification and Labelling of Chemicals (GHS), 9th Revision (2021)

Hazard pictograms :



GHS07

GHS05

GHS09

Signal word :

Danger

Contains :

4-(2,4-DICHLOROPHENOXY) BUTYRIC ACID, SODIUM SALT

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Hazard statements	: H302 - Harmful if swallowed. H318 - Causes serious eye damage . H411 – Toxic to aquatic life with long lasting effects.
Precautionary statements	: P264 + P265- Wash hands thoroughly after handling. Do not touch eyes. P270 - Do not eat, drink or smoke when using this product. P273 - Avoid release to the environment. P280 - Wear protective gloves/protective clothing/eye protection/face protection. P301 + P317 - IF SWALLOWED: Get medical help. P305 + P354 + P338 - IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P330 - Rinse mouth. P391 - Collect spillage. P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

2.3. Other hazards

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %.

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS Classification
4-(2,4-DICHLOROPHENOXY) BUTYRIC ACID, SODIUM SALT	(CAS-No.) 10433-59-7 (EC-No.) 233-917-1	30 -60%	Acute Tox. 4 (Oral), H302 Eye Dam. 1, H318 Aquatic Chronic 2, H411
Citric acid	(CAS-No.) 77-92-9 (EC-No.) 201-069-1 (REACH-no) 01-2119457026-42	<10%	Eye Irrit. 2, H319

Full text of H-statements: see section 16

NOTE 1: The other ingredients not included above do not cause or contribute towards the correct GHS classification of the product and are therefore, in terms of the South African Regulations for Hazardous Chemical Agents - 2021; Regulation 14(b), not listed.

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	Call a poison center or a doctor if you feel unwell.
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact	: Wash skin with plenty of water. Take off contaminated clothing. If skin irritation occurs: Get medical advice/attention.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Call a physician immediately.
First-aid measures after ingestion	: Rinse mouth. Call a poison center or a doctor if you feel unwell. Do not induce vomiting. Give 500 ml water to drink.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation	: May cause shortness of breath, tightness of the chest, a sore throat and cough.
Symptoms/effects after skin contact	: Causes mild skin irritation
Symptoms/effects after eye contact	: Serious damage to eyes.

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Symptoms/effects after ingestion : Abdominal pain, nausea. Ingestion may cause nausea and vomiting. May cause irritation to the digestive tract.

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

Treat symptomatically. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Ventilate spillage area. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment..

6.3. Methods and material for containment and cleaning up

For containment : Absorb spilled material with sand or earth.
Methods for cleaning up : Soak up with inert absorbent material..
Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station. Avoid contact with skin and eyes. Wear personal protective equipment. Avoid the formation of mists in the atmosphere. Do not manipulate the product in a confined space.
Hygiene measures : Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a well-ventilated place. Keep cool. Keep container closed when not in use.

7.3. Specific end use(s)

No additional information available.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

The product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the South African Department of Labour and Employment. The product's ingredients may however pose a health risk.

8.1.2. Recommended monitoring procedures

No additional information available

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

No additional information available

8.1.5. Control banding

No additional information available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Appropriate engineering controls:

Minimise exposure using measures such as contained and enclosed systems, properly designed and maintained dedicated facilities and suitable general/local exhaust ventilation..

8.2.2. Personal protection equipment

Personal protective equipment symbol(s):



8.2.2.1. Eye and face protection

Eye protection:			
Type	Field of application	Characteristics	Standard
Safety glasses, Safety goggles		With side shields	EN 166

8.2.2.2. Skin protection

Skin and body protection:
According to the conditions of use, protective gloves, apron, boots, head and face protection must be worn. EN 14605

Hand protection:					
Wear suitable gloves resistant to chemical penetration.					
Type	Material	Permeation	Thickness (mm)	Penetration	Standard
Reusable gloves	Nitrile rubber (NBR)	6 (> 480 minutes)	0.4		EN ISO 374-1/A1 , EN 16523+A1 (type A)
Reusable gloves	Chloroprene rubber (CR)	6 (> 480 minutes)	0.5		EN ISO 374-1/A1 , EN 16523+A1 (type A)
Reusable gloves	Butyl rubber	6 (> 480 minutes)	0.7		EN ISO 374-1/A1 , EN 16523+A1 (type A)
Disposable gloves					EN ISO 374-1/A1 , EN ISO 374-2 (A,B, or C type)

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Other skin protection

Materials for protective clothing:

Condition	Material	Standard
According to the conditions of use, protective gloves, apron, boots, head and face protection must be worn.		EN 14605

8.2.2.3. Respiratory protection

Respiratory protection:

Users are advised to consider national Occupational Exposure Limits or other equivalent values. Ensure exposure is below occupational exposure limits (where available).

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Device	Filter type	Condition	Standard
Respirator with combination filter for vapour/particles	ABEK	In case of inadequate ventilation wear respiratory protection.	EN 14387

8.2.2.4. Thermal hazards

No additional information available

8.2.3. Environmental exposure controls

Environmental exposure controls:

Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: Dark brown
Odour	: Phenolic
Odour threshold	: Not available
Melting point	: Not applicable
Freezing point	: Not available
Boiling point	: > 100 °C
Flammability)	: Not applicable
Explosive properties	: Product is not explosive.
Oxidising properties	: Non oxidizing material according to EC criteria.
Explosive limits	: Not available.
Lower explosive limit (LEL)	: Not explosive
Upper explosive limit (UEL)	: Not flammable
Flash point	: > 100 °C
Auto-ignition temperature	: > 400 °C
Decomposition temperature	: Not available
pH	: 9.5 – 10
Viscosity, kinematic	: Not available
Viscosity, dynamic	: 25 mPa.s
Solubility	: Miscible with water. Water: Soluble
Partition coefficient n-octanol/water (Log Pow)	: Not available
Partition coefficient n-octanol/water (Log Pow)	: 1.35 (DB)
Vapour pressure	: Not available
Vapour pressure at 50 °C	: Not available
Density	: Not available
Relative density	: 1.238
Relative vapour density at 20 °C	: Not available
Particle size	: Not applicable
Particle size distribution	: Not applicable
Particle shape	: Not applicable
Particle aspect ratio	: Not applicable
Particle aggregation state	: Not applicable
Particle agglomeration state	: Not applicable
Particle specific surface area	: Not applicable
Particle dustiness	: Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

No additional information available

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SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Oxidizing agent. Strong acids. Strong bases.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Combustion produces toxic gases.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity (oral) : Harmful if swallowed.
Acute toxicity (dermal) : Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation) : Not classified (Based on available data, the classification criteria are not met)

MAKHRO 2,4-DB	
LD ₅₀ oral rat	667 – 2000 mg/kg
LD ₅₀ dermal rat	> 2000 mg/kg
LC ₅₀ Inhalation – Rat (Dust/Mist)	> 2.3 mg/l/4h (DB, limit of test)

Citric acid (77-92-9)	
LD ₅₀ oral rat	3 g/kg

Skin corrosion/irritation : Not classified (Based on available data, the classification criteria are not met)
pH: 9.5 – 10
Serious eye damage/irritation : Causes serious eye damage.
pH:9.5 – 10
Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met)
Germ cell mutagenicity : Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity : Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity : Not classified (Based on available data, the classification criteria are not met)
STOT-single exposure : Not classified (Based on available data, the classification criteria are not met)
STOT-repeated exposure : Not classified (Based on available data, the classification criteria are not met)
Aspiration hazard : Not classified (Based on available data, the classification criteria are not met)

11.2 Information on other hazards

11.2.1. Endocrine disrupting properties

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Adverse health effects caused by endocrine disrupting properties : The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

11.2.2 Other information

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Toxic to aquatic life with long lasting effects.
Hazardous to the aquatic environment, short-term (acute) : Not classified
Hazardous to the aquatic environment, long-term (chronic) : Toxic to aquatic life with long lasting effects.

MAKHRO 2,4-DB	
LC ₅₀ 96h fish	17.8 mg/l <i>Oncorhynchus mykiss</i> (Rainbow trout)
EC ₅₀ 48h crustacea	21.2 mg/l <i>Daphnia magna</i> (DB)
EC ₅₀ 72h algae	> 100 mg/l <i>Pseudokirchneriella subcapitata</i>
NOEC chronic fish	63.4 mg/l <i>Pimephales promelas</i>
NOEC chronic crustacea	3 mg/l <i>Daphnia</i>
Additional ecotoxicological information	
14d ErC ₅₀ (<i>Myriophyllum spicatum</i>) 1.57 mg/l 14d ErC ₁₀ (<i>Myriophyllum spicatum</i>) 0.143 mg/l EC ₁₀ (<i>Myriophyllum spicatum</i>) 0.0257mg/L (fresh weight yield) NOEC (<i>Myriophyllum spicatum</i>) 0.191 mg/L	

Citric acid (77-92-9)

LC ₅₀ 96h fish	1516 mg/l (Exposure time: 96 h - Species: <i>Lepomis macrochirus</i> (static))
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12.2. Persistence and degradability

MAKHRO 2,4-DB	
Persistence and degradability	Readily biodegradable.
Biodegradation	DT ₅₀ : 1 - 24.5 d (2,4-DB)

12.3. Bioaccumulative potential

MAKHRO 2,4-DB	
Partition coefficient n-octanol/water (Log Pow)	1.35 (DB)
Bioaccumulative potential	Low bioaccumulation potential.

Citric acid (77-92-9)

Partition coefficient n-octanol/water (Log Pow)	-1.72 (20 °C)
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12.4. Mobility in soil

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Mobility in soil	Limited mobility in the soil column
Partition coefficient n-octanol/water (Log Koc)	Koc = 112.5 - 455.8 (2,4-DB)

12.5. Results of PBT and vPvB assessment

MAKHRO 2,4-DB

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

12.7. Other adverse effects

Other adverse effects None under normal conditions

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	: Dispose of contents/container in accordance with licensed collector's sorting instructions.
Sewage disposal recommendations	: Do not discharge into drains. Disposal must be done according to official regulations.
Product/Packaging disposal recommendations	: Do not re-use empty containers. Dispose in a safe manner in accordance with local/national regulations.

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1. UN number				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
14.2. UN proper shipping name				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
14.3. Transport hazard class(es)				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
14.4. Packing group				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
14.5. Environmental hazards				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
No supplementary information available				

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14.6. Special precautions for user

Overland transport

Not regulated

Transport by sea

Not regulated

Air transport

Not regulated

Inland waterway transport

Not regulated

Rail transport

Not regulated

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

Contains no REACH substances with Annex XVII restrictions

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

Contains no substance subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

15.1.2. National regulations

South Africa

Refer to the Regulations for Hazardous Chemical Agents (2021).

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Full text of H-statements:

Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Chronic 2	Hazardous to the aquatic environment – Chronic Hazard, Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment – Chronic Hazard, Category 3
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
H302	Harmful if swallowed.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.