

LEVULINIC ACID SAFETY DATA SHEET

according to Regulation (EU) n° 453/2010

Date of issue: **02.09.2015**

Version n° **3**

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

1.1. Product identifier

Common name:	LEVULINIC ACID
EC name:	4-oxovaleric acid
EC no:	204-649-2
CAS no:	123-76-2
Pre-registration no:	17-2120058912-53-0000
Formula molecolare:	C ₅ H ₈ O ₃ [CH ₃ -CO-CH ₂ -CH ₂ -COOH]
Peso molecolare:	116.12

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

Chemical intermediate to be converted into derivates for diverse applications, including pharmaceuticals, agrochemicals, personal care, coating and resins, polymers and plasticizers, solvents.

1.3. Details of the supplier of the safety data sheet

Company name:	GF Biochemicals Italy S.p.A. (part of GF Biochemicals Group)
Legal Address:	Viale Angelo Filippetti, 24 - 20122 Milano - Italy
Corporate Office:	Via Durini, 24 - 20122 Milano - Italy
Phone:	+39 02 21118569
Manufacturing:	Viale delle Industrie, 10 - 81100 Caserta - Italy
E-mail:	m.taglietti@gfbiocchemicals.com (competent person responsible for the safety data sheet)
Website:	www.gfbiocchemicals.com

1.4. Emergency telephone number

+39 02-6610-1029 (Centro Antiveleni Niguarda Ca' Granda - Milano)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

The substance is classified as dangerous according to Regulation (EC) 1272/2008 (CLP).

Classification according to Regulation (EC) 1272/2008 (CLP)

Acute toxicity (oral), Hazard Category 4; H302

Skin corrosion/irritation, Hazard Category 2; H315

Serious eye damage/eye irritation, Hazard Category 2; H319

2.2. Label elements

Labelling according to Regulation (EC) 1272/2008 (CLP) - Globally Harmonised System

Hazard pictograms:



Signal word:

warning

Hazard statements:

H302

Harmful if swallowed

H315

Causes skin irritation

H319

Causes serious eye irritation

Precautionary statements:

P280

Wear protective gloves/eye protection/face protection.

P301 + P312

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

P302 + P352

IF ON SKIN: Wash with plenty of water.

P332 + P313

If skin irritation occurs: Get medical advice/attention.

P305 + P351 + P338

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

P337 + P313

If eye irritation persists: Get medical advice/attention.

2.3. Other hazards

The substance does not satisfy the criteria for PBT or vPvB classification according to Annex XIII of Regulation (EC) 1907/2006 (REACH).

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

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3.1. Substances

EC name	EC no	CAS no	Classification Reg. 1272/2008 (CLP)	[%] w/w
4-oxovaleric acid	123-76-2	204-649-2	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Irrit. 2; H319	>99 %

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General indications:	If you feel unwell, get medical advice. Show this safety data sheet.
Contact with the eyes:	Rinse cautiously with water for several minutes, holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice.
Contact with the skin:	Take off all contaminated clothing. Wash with plenty of water. If skin irritation persists, get medical advice. Wash contaminated clothing before reuse.
Inhalation:	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms, give oxygen and get medical advice. In the absence of breathing, provide artificial respiration.
Ingestion:	Rinse mouth with water (only if the person is conscious). Do not induce vomiting. Get medical advice.

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

No specific symptom or effect known (see SECTION 2 and SECTION 11).

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

Basic first aid, decontamination and symptomatic treatment (see SECTION 4.1).

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Use extinguishing media appropriate to the source of the fire and the surrounding area (foam, dry chemical or carbon dioxide.). No extinguishing media is specifically not recommended.

5.2. Special hazards arising from the substance or mixture

The substance is not flammable. In case of fire, carbon oxides and other pyrolysis products may evolve.

5.3. Advice for firefighters

Evacuate and isolate the area until complete fire extinction, by limiting access only to trained personnel. Firefighters must always wear appropriate protective equipment (helmet, boots, fireproof gloves and positive pressure self contained breathing apparatus with facial protective screen) [ref. EN 469]. Prevent the contaminated extinguishing water from flowing into drains or waterways.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment, and procedures in case of emergency

Evacuate and isolate the area until complete dispersion of the substance, by limiting access only to trained personnel. Avoid generation of dust. Avoid breathing dust/mist/vapours and contact with eyes and skin. Ensure adequate ventilation. Wear appropriate personal protective equipment.

6.2. Environmental precautions

Prevent the substance from leaking into the environment and run off into drains, surface waters and groundwater. Alert competent authorities if large amounts into drains or watercourses.

6.3. Methods and material for containment and cleaning up

Cover the drains. Collect the spillage through mechanical means or vacuum cleaners. Transfer into a suitable container properly labeled. Dispose of contents/container at hazardous or special waste collection point, in accordance with local/national regulation. Clean surface thoroughly to remove residual contamination.

6.4. Reference to other sections

For information on personal protection see SECTION 8. For information on disposal considerations, see SECTION 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

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Provide adequate training to workers on safe handling of the substance and on first aid procedures. The work place and work methods shall be organized in such a way that direct contact with the substance is prevented or minimized. Handle in accordance with good industrial hygiene and safety practices. Do not eat, drink, or smoke during use. Wash hands and other exposed areas after use. Wash periodically clothes and personal protective equipment to remove contaminants. Avoid generation of dust. Avoid breathing dust/mist/vapours and contact with eyes and skin. Ensure adequate ventilation. Wear appropriate personal protective equipment.

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, dry and well ventilated place. Keep only in the original container, tightly closed and properly labeled. Avoid exposure to moisture and direct sunlight. Keep away from heat/sparks/open flames/hot surfaces. Keep away from incompatible materials.

7.3. Specific end use(s)

Not defined.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Not defined.

8.2. Exposure controls

Wear personal protective equipment in accordance with standards set by specific legislation. Consult the supplier in all cases before making a final decision.

Skin protection:	Wear protective clothing impervious to chemicals and safety footwear for professional use.
Hand protection:	Wear work gloves impervious to chemicals made of nitrile rubber (thickness = 0.11 mm ; permeation time > 480 minutes) or equivalent [ref. EN 374]. Replace gloves immediately in case of contamination or breakage.
Eye protection:	Wear appropriate safety glasses with side shields [ref. EN 166].
Respiratory protection:	For low exposure levels, wear a dust mask with a type 1 filter [ref. EN 143]. For higher exposure levels, wear a cartridge respirator with a type ABEK-P2 filter [ref. EN 14387 / EN 143]. A final decision on respiratory protection must be taken in all cases on the basis of known or anticipated exposure levels, of the substance hazards and of the safe working limits of the selected device.
Technical and hygienic measures:	Provide local exhaust ventilation suction or other devices to maintain the levels of particles in the air below the recommended exposure limits. Ensure monitoring of emissions in the air and in the environment. Provide the installation of eyewash fountains and emergency showers in the vicinity of the handling of the substance. Do not eat, drink, or smoke during use. Wash hands and other exposed areas after use. Wash periodically clothes and personal protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practices.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

a) Appearance:	white - pale yellow solid
b) Odour:	caramel
c) Odour threshold:	no test available
d) pH:	no test available
e) Melting/freezing point:	26 - 35 °C
f) Initial boiling point and boiling range:	245 - 246 °C (760 mmHg)
g) Flash point:	137 - 138 °C (vaso chiuso)
h) Evaporation rate:	no test available
i) Flammability (solid, gas):	not flammable
j) Upper/lower flammability or explosive limits:	not applicable
k) Vapour pressure:	1 mmHg (102 °C)
l) Vapour density:	4.00
m) Relative density:	1.130 - 1.147
n) Solubility:	soluble in water (675 g/l - 25 °C), alcohol and ether insoluble in aliphatic hydrocarbons
o) Partition coefficient n-octanol/water:	log Pow = -0.49 (calculated)

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p) Auto-ignition temperature:	non self-igniting
q) Decomposition temperature:	no test available
r) Viscosity:	not applicable
s) Explosive properties:	not explosive
t) Oxidising properties:	non-oxidizing

9.2. Other information

u) Acid strength (pKa):	4.5
v) Surface tension:	39.7 dyne/cm (25.5 °C)
w) Heat of evaporation:	0.14 kcal/g (149.5 °C)
x) Heat of fusion:	19 cal/g

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

No particular danger of reaction with other materials under recommended conditions of use.

10.2. Chemical stability

Stable under recommended use and storage conditions.

10.3. Possibility of hazardous reactions

The substance could react violently with bases, oxidizing agents and reducing agents.

10.4. Conditions to avoid

Avoid exposure to moisture and direct sunlight. Keep away from heat/sparks/open flames/hot surfaces. Keep away from incompatible materials.

10.5. Incompatible materials

Bases, oxidizing agents and reducing agents.

10.6. Hazardous decomposition products

In case of thermal decomposition, carbon oxides may evolve.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

a) Acute toxicity

Oral	(rat)	LD ₅₀ = 1850 mg/kg
Dermal	(rabbit)	LD ₅₀ > 5000 mg/kg
Intraperitoneal	(mouse)	LD ₅₀ = 450 mg/kg

The substance is harmful if swallowed.

b) Skin corrosion/irritation

Draize test	(rabbit)	Dose = 500 mg (24 hours)	moderate irritation
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The substance causes skin irritation.

c) Serious eye damage/irritation

The substance causes serious eye irritation.

d) Respiratory or skin sensitisation

No eye respiratory/skin sensitization effect known.

e) Germ cells mutagenicity

No germ cells mutagenicity effect known.

f) Carcinogenicity

No carcinogenicity effect known.

g) Reproductive toxicity

No reproductive toxicity effect known.

h) Specific target organs toxicity (STOT) — single exposure

No STOT effect for single exposure known.

i) Specific target organs toxicity (STOT) — repeated exposure

No STOT effect for repeated exposure known.

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j) Aspiration hazard

No aspiration hazard known.

SEZIONE 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Fishes	(Phimephales promelas)	LC ₅₀ > 1000 mg/L
Daphnids	(Daphnia magna)	EC ₅₀ > 1000 mg/L
Earthworms	Eisenia foetida	EC ₅₀ > 1000 mg/L
Freshwater algae	(Chlamydomonas reinhardtii)	EC ₅₀ > 1000 mg/L
Bacteria	(Vibrio fischeri)	EC ₅₀ > 1000 mg/L

No toxicity effect for aquatic organisms known.

12.2. Persistence and degradability

No test available.

12.3. Bioaccumulative potential

On the basis of the calculated value of the partition coefficient n-octanol/water (log Pow = -0.49), the substance is not expected to bioaccumulate.

12.4. Mobility in soil

No test available.

12.5. Results of PBT and vPvB assessment

The substance does not satisfy the criteria for PBT or vPvB classification according to Annex XIII of Regulation (EC) 1907/2006 (REACH).

12.6. Other adverse effects

The substance does not have effects on the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

The substance must be handled as hazardous waste. Disposal must be performed in accordance with local/national regulation. These provisions are also applicable to the contaminated packaging. It is therefore advisable to contact the authorities or specialized treatment companies that can give indications on how to dispose. The assignment of an appropriate EWC code is a specific responsibility of the waste producer.

SECTION 14. TRANSPORT INFORMATION

The substance is not subject to the provisions of existing legislation governing the transport of dangerous goods by road (ADR), rail (RID), sea (IMDG Code) and air (IATA).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Not applicable.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15. REGULATORY INFORMATION

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

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The substance is not and does not contain as impurities:

- substances of very high concern (SVHC) included in the candidate list for Authorisation
- substances subjected to Authorisation procedure (Annex XIV)
- substances subjected to Restriction procedure (Annex XVII)

according to Regulation (EC) 1907/2006 (REACH).

The storage of the substance is susceptible of application of Directive 96/82/EC - Seveso II (and its subsequent modifications and amendments) as hazardous to the aquatic environment.

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the substance.

SECTION 16. OTHER INFORMATION

Full text of hazard statements (H) cited in SECTION 2 and SECTION 3:

H302	Harmful if swallowed
H315	Causes skin irritation
H319	Causes serious eye irritation

Key references and data sources:

- Ecotoxicity studies of the levulinate ester series, 1 August 2014 - L. Lomba et al
- Other Safety Data Sheets
- Registry of Toxic Effects of Chemical Substances - "Levulinic acid" (RTECS number = OI1575000)
- Regulation (EC) 1272/2008 (CLP) (and its subsequent modifications and amendments)
- Regulation (EC) 1907/2006 (REACH) (and its subsequent modifications and amendments)
- Summary of data on levulinic acid, February 20, 1992 - Covington & Burling

Acronyms:

ADR:	European agreement concerning the international carriage of dangerous goods by road
CAS:	chemical abstracts service
CLP:	classification labelling and packaging
EC ₅₀ :	effective concentration for 50% of the organisms
EINECS:	European inventory of existing commercial chemical substances
EWC:	European wastes catalogue
IATA:	international air transport association
IMDG Code:	International Maritime Dangerous Goods Code
LC ₅₀ :	lethal concentration for 50% of the organisms
LD ₅₀ :	lethal dose for 50% of the organisms
PBT:	persistent, bioaccumulative and toxic
REACH:	registration, evaluation and authorization of chemicals
RID:	regulations concerning the international carriage of dangerous goods by rail
vPvB:	very persistent and very bioaccumulative

Notes:

The information provided in this safety data sheet is correct to the best of our knowledge at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation and disposal and is not to be considered a warranty or quality specification. The user must verify the suitability and completeness of the information in relation to its particular use of the substance.