

Safety Data Sheet

SECTION 1: Identification of the substance and of the company

1.1 Product identifier

NAME: piperazine

PRODUCT CODE: LF-0561

CAS No: 110-85-0

Synonyms/Tradenames:

IUPAC Name: piperazine

MDL No: MFCD00005953

EINECS No:

REACH No: A REACH registration number is not available for this substance as the substance or its uses are exempted from registration. The annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

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

Identified Use: Research and Development

1.3 Details of the supplier of the safety data sheet

Key Organics Limited

Highfield Road Industrial Estate
Camelford
Cornwall PL32 9RA UKTel: +44(0)1840 212171
Fax: +44(0)1840 213712
Email: enquiries@keyorganics.net

1.4 Emergency telephone number

+44(0)1840 212137 between the hours 9am to 5pm Monday to Friday.

SECTION 2: Hazard Identification

2.1 GHS Classification of the substance or mixture

(Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP])

Acute toxicity, inhalation (Category 4)

Acute toxicity, dermal (Category 4)

Acute toxicity, oral (Category 4)

Serious eye damage/eye irritation (Category 2A)

Specific target organ toxicity, single exposure; Respiratory tract irritation (Category 3)

Skin corrosion/irritation (Category 2)

Sensitisation, Skin (Category 1)

Sensitisation, respiratory (Category 1)

Reproductive toxicity (Category 2)

Serious eye damage/eye irritation (Category 1)

Flammable solids (Category 1)

2.2 Label elements

(Labelling according to Regulation (EC) No 1272/2008 [EU-GHS/CLP])

Signal Word: Danger

Issue Date: 01 December 2017

According to Regulation (EC) 2015/830

Revision Date: 26 August 2025



H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.

Precautionary Phrases:

P201	Obtain special instructions before use.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P232	Protect from moisture.
P240	Ground/bond container and receiving equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P262	Do not get in eyes, on skin, or on clothing.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/attention.
P310	Immediately call a POISON CENTER or doctor/physician.
P402 + P404	Store in a dry place. Store in a closed container.
P403 + P235	Store in a well-ventilated place. Keep cool.
P422	Store contents under inert gas.

2.3 Other Hazards

No Information Available

SECTION 3: Composition/Information on ingredients**3.1 Substances**

LF-0561: 110-85-0 piperazine

MF: C₄H₁₀N₂ MW: 86.1400**3.2 Mixtures**

Not relevant.

SECTION 4: First Aid Measures**4.1 Description of the first aid measures**

Skin Contact

Remove any contaminated clothing and shoes. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention.

Eye Contact	Hold eyelids open and rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation or visual changes persists: Get medical advice/attention.
Ingestion	Do not induce vomiting. If victim is conscious and alert, give 1-2 glasses of water to wash out mouth thoroughly. Do not give anything by mouth to an unconscious person. Get medical advice/attention. Do not leave victim unattended.
Inhalation	If respiratory irritation or distress occurs, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if respiratory irritation or distress continues.

4.2 Most important symptoms and effect, both acute and delayed

To the best of our knowledge the acute and delayed symptoms and effects of this substance are not fully known.

4.3 Indication of any immediate medical attention and special treatment needed

Call a POISON CENTRE or doctor/physican if you feel unwell.
No additional measures required.

SECTION 5: Firefighting Measures

5.1 Extinguishing media

Suitable:	Carbon Dioxide Dry Chemical Powder AFFF Water
Unsuitable:	Do not use water with a full water jet.

5.2 Special hazards arising from the substance or mixture

In combustion toxic fumes may form.

5.3 Advice for fire fighters

Wear protective clothing to prevent contact with skin and eyes.
Wear self-contained breathing apparatus.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures.

Refer to section 8 of SDS for personal protection details.

6.2 Environmental precautions.

Do not discharge into rivers and drains.

6.3 Methods and materials for containment and cleaning up

Mix with sand or vermiculite, transfer to suitable container and arrange disposal by approved disposal specialists.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling

Safe handling:	Do not store, use, and/or consume foods, beverages, tobacco products or cosmetics in areas where this material is stored. Wash hands and face carefully before eating, drinking, using tobacco or applying cosmetics in areas where this material is stored. Handle in BS approved adequately ventilated fume cupboard. Wash exposed skin promptly to remove accidental splashes of contact with this material. Remove and thoroughly wash any clothing if spillage occurs.
Protection against explosions and fires:	Undertake normal measures for fire protection. Minimal explosion risk.

7.2 Conditions for safe storage, including any incompatibilities

Managing storage risks:	Keep container tightly closed, store in cool, well ventilated area.
Storage controls:	Store under inert gas, Hygroscopic
Maintaining integrity:	Keep in tightly closed container in a cool area away from direct sunlight or heat sources.
Further information about storage conditions:	Store in well ventilated place. Keep container tightly closed.

7.3 Specific end use(s)

The end use(s) have not been fully determined. The substance is supplied for Research and Development purposes only and should be handled by appropriately trained professionals only.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control parameters

No data available.

8.2 Exposure controls

General protective & hygiene measures:	Wear protective gloves/protective clothing/eye protection/face protection. The standard precautionary measures should be adhered to when handling this material. Wash hands during breaks and at the end of handling the material. Remove immediately any contaminated clothing or footwear and either wash thoroughly or dispose of in hazardous waste.
Engineering measures:	Set up hand-wash station and eye station near work area. General area dilution/exhaust ventilation. Use only in a BS approved fume cupboard or in a well ventilated area.
Eye/face protection:	Safety glasses (NIOSH(US) or EN 166(EU)) and/or full face visor if handling large amounts.
Hand protection:	Suitable protective gloves or gauntlets satisfying EU Directive 89/686/EEC and the standard EN374 derived from it.
Respiratory protection:	Avoid breathing dust, fumes, gas, mist, vapours or sprays. For low level exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABE1P3D (EU EN 143) respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Skin protection:	Protective clothing and gloves or gauntlets.
Other personal protection advice::	No data.

SECTION 9: Physical and Chemical Properties

9.1 Physical and chemical properties

Appearance/form:	White to Off-white Solid
Molecular formula:	C4H10N2
Molecular weight:	86.14
Odour:	weakly amine-like
Odour threshold:	No data available
pH:	12 at 150 g/l at 20 °C
Melting/Boiling point (°C):	MP: 109 - 112 °C - lit. BP: 145 - 146 °C at 1,013 hPa
Flash point:	No data available
Evaporation rate:	No data available
Flammability (solid,gas):	The substance or mixture is a flammable solid with the category 1. Flammability:
Upper/lower explosive limits:	Upper explosion limit: 14 %(V) Lower explosion limit: 4 %(V)
Vapour pressure:	0.21 hPa at 20 °C
Vapour density:	No data available
Relative density:	1.1 g/cm ³ at 20 °C Bulk density: 100 kg/m ³
Solubility(ies):	Water solubility ca.0.9 g/l at 20 °C - soluble
Partition coefficient:	og Pow: -1.24 at 25 °C - Bioaccumulation is not expected.
Auto ignition temperature:	320 °C at 1,013 hPa - DIN 51794
Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No data available
Oxidising properties:	No data available

9.2 Other information

No other information is available.

SECTION 10: Stability and Reactivity

10.1 Reactivity

No unusual reactivity.

10.2 Chemical stability

Stable under normal conditions as stated in section 7.

10.3 Possibility of hazardous reactions

Caution! In contact with nitrites, nitrates, nitrous acid possible liberation of nitrosamines!

Violent reactions possible with:

Strong oxidizing agents

Acids

10.4 Conditions to avoid

Avoid Moisture. Heat, flames and sparks. Moisture, Metals, Alloys

10.5 Incompatible materials

Light metals, Metals, various alloys, Strong oxidizing agents

10.6 Hazardous decomposition products

In combustion emits toxic fumes.

SECTION 11: Toxicology Information

All the data contained in this section is derived from actual test data unless otherwise stated.

11.1 Information on toxicology effects

Acute toxicity:	LD50 Oral - Rat - 2,600 mg/kg LC0 Inhalation - Rat - 4 h - 0.8 mg/l LD50 Dermal - Rabbit - 8,300 mg/kg
Skin corrosion/irritation:	Causes severe skin irritation.Skin - Rabbit Result: Causes burns. Remarks: No data available
Serious eye damage/irritation:	Causes severe eye damage and serious eye irritation.Eyes - Rabbit Result: Severe eye irritation - 24 h
Respiratory or skin sensitisation:	Maximisation Test - Guinea pig May cause sensitisation by skin contact
Germ cell mutagenicity:	Test Type: In vitro mammalian cell gene mutation test Test system: Mouse lymphoma test Metabolic activation: Metabolic activation Method: OECD Test Guideline 476 Result: positive Test Type: Ames test Test system: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative Test Type: Chromosome aberration test in vitro Test system: Chinese hamster ovary cells Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 473 Result: negative Test Type: Micronucleus test Species: Mouse Cell type: Bone marrow Application Route: Gavage Method: OECD Test Guideline 474 Result: negative
Carcinogenicity:	No data available.
Reproductive toxicity:	Suspected of damaging the unborn child. Suspected of damaging fertility.
STOT single exposure:	No data available.
STOT repeated exposure:	No data available.
Aspiration hazard:	No data available.
Signs and Symptoms of Exposure:	No data available.

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - NOAEL (No observed adverse effect level) - 627 mg/kg

RTECS: TK7800000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache, Nausea, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Drowsiness

ataxia (impaired locomotor coordination)

Unconsciousness

Apathy

muscular weakness

Impairment of vision

Other information

Under given conditions, contact with nitrites or nitric acid can lead to the formation of nitrosamines, which have shown themselves to be carcinogenic in animal experiments.

Further data:

Therapeutically used substance.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: Ecological Information

All the data contained in this section is derived from actual test data unless otherwise stated.

12.1 Toxicity

Toxicity to fish LC50 - *Poecilia reticulata* (guppy) - > 1,800 mg/l - 96.0 h

Toxicity to daphnia and other aquatic invertebrates EC50 - *Daphnia magna* (Water flea) - 21 mg/l - 48 h

Toxicity to algae EC50 - *Pseudokirchneriella subcapitata* (green algae) - > 1,000 mg/l - 72 h

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 28 d

Result: 65 % - Readily biodegradable

12.3 Bioaccumulative potential

Bioaccumulation *Cyprinus carpio* (Carp) - 6 Weeks

at 25 °C(piperazine)

Bioconcentration factor (BCF): 0.3

(OECD Test Guideline 305)

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher

12.6 Other adverse effects

No data available.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

Disposal considerations:

Consult state, local or national regulations for proper disposal.

Disposal of packaging:

Disposal must be made according to official regulations.

SECTION 14: Transport Information

14.1 UN number

2579

14.2 UN proper shipping name

PIPERAZINE

14.3 Transport class(es)

8

14.4 Packaging group

III

14.5 Environmental hazards

Air (ICAO/IATA): No

Road (ADR/RID): No

Sea (IMDG): No

14.6 Special precautions for user

Air (ICAO/IATA): No data available

Road (ADR/RID): No data available

Sea (IMDG): No data available

SECTION 15: Regulatory Information

15.1 Safety, health and environmental regulations

Product is not subject to any additional regulations or provisions. This datasheet complies with the requirements of regulations (EC) No. 1907/2006.

15.2 Chemical safety assessment

No chemical safety assessment under Regulation (EC) 1907/2006 is required and has not been carried out.

SECTION 16: Other Information

Date of Previous SDS: 14 September 2023

Date of Revision: 26 August 2025

List of abbreviations used within SDS:

ADR: Accord European sur le transport des marchandises Dangereuses par Route (European Agreement concerning the international Carriage of Dangerous Goods by road).

RID: Reglement International concernant le transport des marchandises par chemin de fer (Regulations concerning the International transport of Dangerous Goods by Rail).

IMDG: International Maritime Code of Dangerous goods.

IATA: International Air Transport Association.

IATA-DGR: Dangerous Goods Regulations by the International Air Transport Association.

ICAO: International Civil Aviation Organisation.

ICAO-IT: Technical Instructions by the ICAO.

GHS: Globally Harmonised System of Classification and Labelling of Chemicals.

CAS: Chemical Abstracts Service.

IUPAC: International Union for Pure and Applied Chemistry.

MDL: Molecular Design Ltd

EINECS: European Inventory of Existing Commercial Chemical Substances.

EPA: European Protection Agency.

IARC: International Agency on Research on Cancer.

NTP: National Toxicology Program.

OSHA: Occupational Safety and Health Administration.

ACGIH: American Conference of Industrial Hygienists.

Disclaimer

The information in this Safety Data Sheet is correct to the best of our knowledge at the date of publication. However, the information given should be considered only as a guide. The product listed is for research and development purposes only and not for human or animal use. As such the toxicological, ecological and physicochemical properties have not been fully investigated or determined and the product should be treated with respect and always handled under suitable conditions by suitably qualified personnel. The responsible party shall use this datasheet only in conjunction with other sources of information gathered by them, and should make an independent judgement of suitability, to ensure proper use and protect the health and safety of employees. This Safety Data Sheet is not intended to be a replacement of any statutory assessments required to be completed by the user. This information is furnished without warranty and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Key Organics Ltd. cannot accept liability for any loss, damage or injury which may result from the use of this product.

End of SDS