Safety Data Sheet

# Triethyl 2-fluoro-2-phosphonoacetate

Version：V2.0.0.1
Report No.：A021619_EU_EN
Creation Date：2026/07/24
Revision Date：-

*Prepared in accordance with EU REACH Regulation (REACH 1907/2006 with amendment 2020/878)

## Part 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

| | |
|---|---|
| Product Name | Triethyl 2-fluoro-2-phosphonoacetate |
| Product Model | 98% |
| Cat No. | A021619 |
| CAS No. | 2356-16-3 |
| EC No. | 627-648-2 |
| Molecular Formula | $C_8H_{16}FO_5P$ |
| REACH Registration Number | Not available from the supplier. The applicability of REACH registration obligations shall be assessed by the EU importer based on the actual annual import tonnage, use and applicable exemptions. |
| UFI | Not applicable |

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

| | |
|---|---|
| Relevant identified uses | Laboratory chemicals / R&D use only |
| Uses advised against | Food, drug, cosmetic, household or other uses |

### 1.3 Details of the supplier of the Safety Data Sheet

| | |
|---|---|
| Supplier Name | Pharmate GmbH |
| Supplier Address | Monschauer Str. 12, Düsseldorf, Germany |
| Supplier Post Code | 40549 |
| Supplier Telephone | +49 211 54224195 |
| Supplier Fax | —— |
| Supplier E-mail | info@pharmaten.de |
| Manufacturer Name | Anhui Senrise Technology Co., Ltd. |
| Manufacturer Address | No. 88, Weisan Road, High-tech Development Zone, Daguan District, Anqing, Anhui Province, China |
| Manufacturer Post Code | 246005 |
| Manufacturer Telephone | 400-005-6266 |
| Manufacturer Fax | +86（0）556-5555368 |
| Manufacturer E-mail | Service@3ASenrise.com |

### 1.4 Emergency telephone number

| | |
|---|---|
| Emergency telephone number | 0800 181 7059 (CHEMTREC Germany)<br>Additional numbers: +44 20 3885 0382 / +1 703 527 3887<br>CHEMTREC Customer Number (CCN): 1025941 |
| Opening hours | 24h |

# Part 2: Hazards identification

## 2.1 CLP classification according to Regulation (EC) No. 1272/2008 with amendment 2023/707

| | |
|---|---|
| Skin Corrosion/Irritation | Category 2 |
| Serious eye damage/irritation | Category 2 |
| Specific target organ toxicity - single exposure; respiratory tract irritation | Category 3 |

## 2.2 Label elements

| | |
|---|---|
| Hazard pictograms |  |
| Signal word | **Warning** |

## Hazard statements

| | |
|---|---|
| H315 | Causes skin irritation |
| H319 | Causes serious eye irritation |
| H335 | May cause respiratory irritation |

## Precautionary statements

◆Prevention

| | |
|---|---|
| P261 | Avoid breathing gas/mist/vapour/spray. |
| P264 | Wash hands and other parts of the body (if related) thoroughly after handling. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |

◆Response

| | |
|---|---|
| P312 | Call a POISON CENTER/doctor, if you feel unwell. |
| P321 | Specific treatment (see related instructions on the label). |
| P302+P352 | IF ON SKIN: Wash with plenty of water. |
| P304+P340 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| P332+P313 | If skin irritation occurs: Get medical advice/attention. |
| P337+P313 | If eye irritation persists: Get medical advice/attention. |
| P362+P364 | Take off contaminated clothing and wash it before reuse. |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |

◆Storage

| | |
|---|---|
| P405 | Store locked up. |
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |

◆Disposal

| | |
|---|---|
| P501 | Dispose of contents/container in accordance with local/regional/national/international regulations. |

## 2.3 Other hazards

◆Results of PBT and vPvB assessment

| Component | Results of PBT and vPvB assessment [according to (EC) No 1907/2006 with amendment 2020/878] |
|---|---|
| **Triethyl 2-fluoro-2-phosphonoacetate** | No information available |

◆Results of endocrine disrupting properties assessment

| Component | Results of endocrine disrupting properties assessment [according to (EU) No 2017/2100 or (EU) No 2018/605] | |
|---|---|---|
| | **Human endocrine disruptor** | **Environmental endocrine disruptor** |
| **Triethyl 2-fluoro-2-phosphonoacetate** | No information available | No information available |

◆Other

| | |
|---|---|
| | Not applicable. |

## Part 3: Composition/information on ingredients

### 3.1 Substance

| Component | Weight % content(or range) | Classification according to Regulation (EC) No. 1272/2008 with amendment 2023/707 [CLP] | SCL, M-factor and ATE |
|---|---|---|---|
| **Triethyl 2-fluoro-2-phosphonoacetate**<br>CAS No.：2356-16-3<br>EC No.：627-648-2<br>Index No.：- | ≥ 98 | Skin Corrosion/Irritation, Category 2, H315; Serious eye damage/irritation, Category 2, H319; Specific target organ toxicity - single exposure; respiratory tract irritation, Category 3, H335 | - |

### 3.2 Mixture

| | |
|---|---|
| | Not applicable |

## Part 4: First aid measures

### 4.1 Description of first aid measures

| | |
|---|---|
| **General advice** | Immediate medical attention is required. Show this safety data sheet (SDS) to the doctor in attendance. |
| **Eye contact** | Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician if feel uncomfortable. |
| **Skin contact** | Take off contaminated clothing and shoes immediately. Wash off with plenty of soap and water for at least 15 minutes and consult a physician if feel uncomfortable. |
| **Ingestion** | Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center immediately. |
| **Inhalation** | Move victim into fresh air. If breathing is difficult, give oxygen. Do not use mouth to mouth resuscitation if victim ingested or inhaled the substance. If not breathing, give artificial respiration and consult a physician immediately. |
| **Protecting of first-aiders** | Ensure that medical personnel are aware of the substance involved. Take precautions to protect themselves and prevent spread of contamination. |

### 4.2 Most important symptoms/effects, acute and delayed

| | |
|---|---|
| 1 | Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. |

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

| | |
|---|---|
| 1 | Treat symptomatically. |
| 2 | Symptoms may be delayed. |

## Part 5: Fire-fighting measures

### 5.1 Extinguishing media

| | |
|---|---|
| Suitable extinguishing media | Use extinguishing media suitable for surrounding area. |
| Unsuitable extinguishing media | There is no restriction on the type of extinguisher which may be used. |

### 5.2 Specific hazards arising from the substance or mixture

| | |
|---|---|
| 1 | Development of hazardous combustion gases or vapor possible in the event of fire. |
| 2 | May expansion or decompose explosively when heated or involved in fire. |

### 5.3 Advice for firefighters

| | |
|---|---|
| 1 | As in any fire, wear self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) and full protective gear. |
| 2 | Fight fire from a safe distance, with adequate cover. |
| 3 | Prevent firefighting wastewater from contaminating surface water or the ground water system. |

## Part 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

| | |
|---|---|
| 1 | Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges. |
| 2 | Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. |
| 3 | Use personal protective equipment,do not breathe gas/mist/vapour/spray. |

### 6.2 Environmental precautions

| | |
|---|---|
| 1 | Prevent further leakage or spillage if safe to do so. |
| 2 | Discharge into the environment must be avoided. |

### 6.3 Methods and materials for containment and cleaning up

| | |
|---|---|
| 1 | Keep leaks in a ventilated place. |
| 2 | Cut off the source of the leak as much as possible. |
| 3 | Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations. |
| 4 | Absorb spilled material in dry sand or inert absorbent. In case of large amount of spillage, contain a spill by bunding. |
| 5 | Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container. |

### 6.4 Reference to other sections

| | |
|---|---|
| 1 | Personal Protective Equipment advice is contained in Section 8 of the SDS. |
| 2 | Disposal considerations advice is contained in Section 13 of the SDS. |

## Part 7: Handling and storage

### 7.1 Precautions for safe handling

◆ Protective measures

| | |
|---|---|
| 1 | Handling is performed in a well ventilated place. |
| 2 | Wear suitable protective equipment. |
| 3 | Avoid contact with skin and eyes. |

◆ Measures to prevent fire

| | |
|---|---|
| 1 | Keep away from heat/sparks/open flames/ hot surfaces. |

◆ Measures to prevent aerosol and dust generation

| | |
|---|---|
| 1 | Not applicable. |

◆ Advice on general occupational hygiene

| | |
|---|---|
| 1 | Wash hands and face after using of the substances. |
| 2 | Replace the contaminated clothing immediately. |

### 7.2 Conditions for safe storage, including any incompatibilities

| | |
|---|---|
| 1 | Keep containers tightly closed. |
| 2 | Keep containers in a dry, cool and well-ventilated place. |
| 3 | Keep away from heat/sparks/open flames/hot surfaces. |
| 4 | Store away from incompatible materials and foodstuff containers. |
| 5 | Store only in the original container in accordance with national regulations (German TRGS 510). |
| 6 | Storage class (LGK) according to TRGS 510: 10 |

### 7.3 Specific end use(s)

| | |
|---|---|
| 1 | In addition to use mentioned in the Section 1.2, unforeseen other specific end uses. |

## Part 8: Exposure controls/personal protection

### 8.1 Control parameters

◆Occupational exposure limit values

| | |
|---|---|
| **Occupational Exposure limit values** | No relevant regulations |

◆Biological limit values

| | |
|---|---|
| **Biological limit values** | No relevant regulations |

◆Monitoring methods

| | |
|---|---|
| **Monitoring methods** | Use suitable workplace exposure monitoring methods in accordance with applicable EU/UK and national requirements. Where applicable, methods meeting EN 482 and EN 14042 may be used. For Germany, monitoring of inhalation exposure should be carried out in accordance with TRGS 402; IFA/DGUV methods may be used where applicable. |

◆ Derived No effect level (DNEL)

| Component | Route of exposure | DNEL for Workers | | | |
|---|---|---|---|---|---|
| | | Acute effects (local) | Acute effects (systemic) | Chronic effects (local) | Chronic effects (systemic) |
| Triethyl 2-fluoro-2-phosphonoacetate | Inhalation | No information available | No information available | No information available | No information available |
| | Oral | No information available | No information available | No information available | No information available |
| | Dermal | No information available | No information available | No information available | No information available |

◆ Predicted No Effect Concentration (PNEC)

| | |
|---|---|
| Predicted No Effect Concentration (PNEC) | No information available |

### 8.2 Exposure controls

#### 8.2.1 Engineering controls

| | |
|---|---|
| 1 | Ensure adequate ventilation, especially in confined areas. |
| 2 | Ensure that eyewash stations and safety showers are close to the workstation location. |
| 3 | Set up emergency exit and necessary risk-elimination area. |
| 4 | Handle in accordance with good industrial hygiene and safety practice. |

#### 8.2.2 Personal protection equipment

| | |
|---|---|
| General requirement |  |
| Eye protection | Must wear appropriate safety goggles. |
| Hand protection | Must wear appropriate chemical protective gloves. |
| Respiratory protection | Must wear appropriate personal respiratory protective equipment. |
| Skin and body protection | Must wear appropriate chemical protective clothing and chemical resistant shoes. |

#### 8.2.3 Environmental exposure controls

| | |
|---|---|
| Environmental exposure controls | No information available |

## Part 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

| | |
|---|---|
| Physical state | liquid |
| Colour | Colorless to pale yellow |
| Odour | No information available |
| Odour threshold | No information available |
| pH | No information available |
| Melting point/freezing point(℃) | No information available |
| Boiling point/freezing point(℃) | No information available |
| Flash point(Closed cup,℃) | No information available |
| Evaporation rate | No information available |
| Flammability | No information available |
| Lower and upper explosion limit/flammability limit [%(v/v)] | Upper limit: No information available; Lower limit: No information available |

| | |
|---|---|
| Vapour pressure | No information available |
| Relative vapour density(Air = 1) | No information available |
| Relative density(Water=1) | No information available |
| Solubility(mg/L) | No information available |
| Partition coefficient n-octanol/water (log value) | No information available |
| Auto-ignition temperature(℃) | No information available |
| Decomposition temperature(℃) | No information available |
| Kinematic viscosity($mm^2/s$) | No information available |
| Explosive properties | No information available |
| Oxidizing properties | No information available |
| Particle characteristics | Not applicable |

### 9.2 Other information

### 9.2.1 Information with regard to physical hazard classes

| | |
|---|---|
| Information with regard to physical hazard classes | No information available |

### 9.2.2 Other safety characteristics

| | |
|---|---|
| Other safety characteristics | No information available |

## Part 10: Stability and reactivity

### Stability and reactivity

| | |
|---|---|
| 10.1 Reactivity | Contact with incompatible substances can cause decomposition or other chemical reactions. |
| 10.2 Chemical stability | Stable under proper operation and storage conditions. |
| 10.3 Possibility of hazardous reactions | No information available. |
| 10.4 Conditions to avoid | Incompatible materials, heat, flame and spark. |
| 10.5 Incompatible materials | No information available. |
| 10.6 Hazardous decomposition products | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

## Part 11: Toxicological information

### 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008 with amendment 2023/707

| Triethyl 2-fluoro-2-phosphonoacetate(Component) | |
|---|---|
| Skin corrosion/irritation | Causes skin irritation(Category 2) |
| Serious eye damage/irritation | Causes serious eye irritation(Category 2) |
| Skin sensitization | Based on available data, the classification criteria are not met |
| Respiratory sensitization | Based on available data, the classification criteria are not met |
| Reproductive toxicity | Based on available data, the classification criteria are not met |
| STOT-single exposure | May cause respiratory irritation(Category 3) |
| STOT-repeated exposure | Based on available data, the classification criteria are not met |
| Aspiration hazard | Based on available data, the classification criteria are not met |

| | |
|---|---|
| Germ cell mutagenicity | Based on available data, the classification criteria are not met |

### Acute toxicity

| | |
|---|---|
| Acute toxicity | No information available |

### Carcinogenicity

| Component | List of carcinogens by the IARC Monographs | Report on Carcinogens by NTP |
|---|---|---|
| Triethyl 2-fluoro-2-phosphonoacetate | Not Listed | Not Listed |

### 11.2 Information on other hazards

### 11.2.1 Human endocrine disrupting properties

| Component | Human endocrine disrupting properties |
|---|---|
| Triethyl 2-fluoro-2-phosphonoacetate | No information available |

### 11.2.2 Other Information

| | |
|---|---|
| Other Information | See Section 11.1 |

## Part 12: Ecological information

### 12.1 Toxicity

### Acute aquatic toxicity

| | |
|---|---|
| Acute aquatic toxicity | No information available |

### Chronic aquatic toxicity

| | |
|---|---|
| Chronic aquatic toxicity | No information available |

### 12.2 Persistence and degradability

| | |
|---|---|
| Persistence and degradability | No information available |

### 12.3 Bioaccumulative potential

| | |
|---|---|
| Bioaccumulative potential | No information available |

### 12.4 Mobility in soil

| | |
|---|---|
| Mobility in soil | No information available |

### 12.5 Results of PBT and vPvB assessment

| Component | Results of PBT and vPvB assessment [according to (EC) No 1907/2006 with amendment 2020/878] |
|---|---|
| Triethyl 2-fluoro-2-phosphonoacetate | No information available |

### 12.6 Endocrine disrupting properties

| Component | Endocrine disrupting properties |
|---|---|

| | |
|---|---|
| **Triethyl 2-fluoro-2-phosphonoacetate** | No information available |

### 12.7 Other adverse effects

| | |
|---|---|
| | No information available |

## Part 13: Disposal considerations

### 13.1 Waste treatment methods

| | |
|---|---|
| **Waste chemicals** | Before disposal should refer to the relevant national and local laws and regulation. Recommend the use of incineration disposal. |
| **Contaminated packaging** | Containers may still present chemical hazard when empty. Keep away from hot and ignition source of fire. Return to supplier for recycling if possible. |
| **Disposal recommendations** | Refer to section waste chemicals and contaminated packaging. |

## Part 14: Transport information

### Label

| | |
|---|---|
| **Transporting Label** | Not applicable |

### IMDG-CODE

| | |
|---|---|
| **IMDG-CODE** | NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS |

### IATA-DGR

| | |
|---|---|
| **IATA-DGR** | NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS |

### UN-ADR

| | |
|---|---|
| **UN-ADR** | NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS |

### Special precautions for user

| | |
|---|---|
| | Transport vehicles should be equipped with the appropriate variety and quantity of fire equipment and emergency equipment leakage during transport. Before transport, should be preceded by checking whether container integrity, sealing. The transport unit must be placarded and marked in accordance with relevant transporting requirements. |

### Maritime transport in bulk according to IMO instruments

◆Transport in bulk according to Annex II of MARPOL and the IBC code

| | |
|---|---|
| | No information available |

◆Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

| | |
|---|---|
| | No information available |

◆Transport in bulk in accordance with the IGC Code

| | |
|---|---|
| | No information available |

## Part 15: Regulatory information

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

### International chemical inventory

| Component | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Triethyl 2-fluoro-2-phosphonoacetate** | × | × | × | × | × | × | × | × | × | × | × | × | √ |

【A】 China Inventory of Existing Chemical Substances(IECSC)
【B】 European Inventory of Existing Commercial Chemical Substances(EC inventory)
【C】 United States Toxic Substances Control Act Inventory(TSCA)
【D】 Canadian Domestic Substances List(DSL)
【E】 New Zealand Inventory of Chemicals(NZIoC)
【F】 Philippines Inventory of Chemicals and Chemical Substances(PICCS)
【G】 Korea Existing Chemicals Inventory(KECL)
【H】 Australian Inventory of Industrial Chemicals(AIIC)
【I】 Japan Inventory of Existing & New Chemical Substances(ENCS)
【J】 Thailand Existing Chemicals Inventory(TECI)
【K】 Mexico National Inventory of Chemical Substances(INSQ)
【L】 Russia Inventory of Existing Substances(DRAFT)
【M】 Inventory of Existing Chemical Substances in Taiwan, China(TCSI)

## List of Chemical Substances under International Conventions

| Component | A | B | C |
|---|---|---|---|
| **Triethyl 2-fluoro-2-phosphonoacetate** | × | × | × |

【A】 The Montreal Protocol on Substances that Deplete the Ozone Layer
【B】 Stockholm Convention on Persistent Organic Pollutants (POPs)
【C】 Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade

## European chemical inventory

| Component | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| **Triethyl 2-fluoro-2-phosphonoacetate** | × | × | × | × | × | × | × | × |

【A】 Candidate list of Substances of Very High Concern for authorisation under EU REACH regulation
【B】 Substances requiring authorisation under EU REACH regulation
【C】 Substances restricted under EU REACH
【D】 Registered substances under EU REACH
【E】 Substance Evaluation – CoRAP under EU REACH
【F】 List of priority substances under EU water policy
【G】 Substances subject to POPs Regulation
【H】 Substances proposed as POPs

Note:
"√" Indicates that the substance included in the regulations.
"×" No data or not included in the regulations.

## German water hazard class(WGK)

| | |
|---|---|
| | WGK 3 – highly hazardous to water (precautionary classification according to AwSV; no published WGK classification available). |

## German technical instructions on air quality control(TA LUFT)

| | |
|---|---|
| | No information available |

## German technical rules for hazardous substances(TRGS)

| | |
|---|---|
| | No information available |

## 15.2 Chemical safety assessment

| | |
|---|---|
| | No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier. |

## Part 16: Other information

### Information on revision

| | |
|---|---|
| **Creation Date** | 2026/07/24 |
| **Revision Date** | - |
| **Reason for revision** | - |

### Reference


[1] IPCS: The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home.
[2] IARC, website: http://www.iarc.fr/.
[3] OECD: The Global Portal to Information on Chemical Substances, website: https://www.echemportal.org/echemportal/.
[4] CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple.
[5] NLM: ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp.
[6] EPA: Integrated Risk Information System, website: http://cfpub.epa.gov/iris/.
[7] U.S. Department of Transportation: ERG, website: http://www.phmsa.dot.gov/hazmat/library/erg.
[8] Germany GESTIS-database on hazard substance, website: http://gestis-en.itrust.de/.


### Abbreviations and acronyms

| | | | |
|---|---|---|---|
| CAS | Chemical Abstracts Service | UN | The United Nations |
| PC-STEL | Short term exposure limit | OECD | Organisation for Economic Co-operation and Development |
| PC-TWA | Time Weighted Average | IMDG-CODE | International Maritime Dangerous Goods CODE |
| MAC | Maximum Allowable Concentration | IARC | International Agency for Research on Cancer |
| DNEL | Derived No Effect Level | ICAO | International Civil Aviation Organization |
| PNEC | Predicted No Effect Concentration | IATA | International Air Transport Association |
| NOEC | No Observed Effect Concentration | ACGIH | American Conference of Governmental Industrial Hygienists |
| $LC_{50}$ | Lethal Concentration 50% | NFPA | National Fire Protection Association |
| $LD_{50}$ | Lethal Dose 50% | NTP | National Toxicology Program |
| $EC_{50}$ | Effective Concentration 50% | PBT | Persistent, Bioaccumulative, Toxic |
| $EC_X$ | Effective Concentration X% | vPvB | very Persistent, very Bioaccumulative |
| $P_{OW}$ | Partition coefficient Octanol: Water | CMR | Carcinogens, mutagens or substances toxic to reproduction |
| BCF | Bioconcentration factor | RPE | Respiratory Protective Equipment |
| ED | Endocrine disruptor | G1 | Carcinogenic to humans |
| G2A | Probably carcinogenic to humans | G2B | Possibly carcinogenic to humans |
| G3 | Not yet classified as carcinogenic to humans | G4 | Probably not carcinogenic to humans |

### Disclaimer

This Safety Data Sheet (SDS) was prepared according to REACH Regulation The data included was derived from international authoritative database and provided by the enterprise. Other information was based on the present state of our knowledge. We try to ensure the correctness of all information. However, due to the diversity of information sources and the limitations of our knowledge, this document is only for user's reference. Users should make their independent judgment of suitability of this information for their particular purposes. We do not assume responsibility for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.