

Safety Data Sheet

according to UK REACH Regulation

TFA

Revision date: 08.10.2018

Product code: SOL-011

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SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier**

TFA

Further trade namesTrifluoroacetic Acid
Perfluoessigsäure
2,2,2-Trifluoroacetic acidAbbreviation: TFA
CAS No: 76-05-1
EC No: 200-929-3**1.2. Relevant identified uses of the substance or mixture and uses advised against****Use of the substance/mixture**

Chemical for synthesis. Laboratory chemical.

Uses advised against

Do not use for private purposes (household).

1.3. Details of the supplier of the safety data sheet

Company name:	Iris Biotech GmbH	
Street:	Adalbert-Zoellner-Straße 1	
Place:	D-95615 Marktredwitz, Germany	
Post-office box:	568	
	D-95605 Marktredwitz, Germany	
Telephone:	+49 9231 97121 0	Telefax: +49 9231 97121 99
e-mail:	info@iris-biotech.de	
Contact person:	Compliance Department	Telephone: +49 9231 97121 0
e-mail:	sds@iris-biotech.de	
Internet:	www.iris-biotech.de	
Responsible Department:	Only available during office hours.	

1.4. Emergency telephone number: +49 (0)89 19240 (POISON CENTER Munich: 24 h)**Further Information**

Emergency telephone number / 24 h: +49 (0)89 19240

SECTION 2: Hazards identification**2.1. Classification of the substance or mixture****GB CLP Regulation**Acute Tox. 4; H332
Skin Corr. 1A; H314
Aquatic Chronic 3; H412

Full text of hazard statements: see SECTION 16.

2.2. Label elements**GB CLP Regulation****Signal word:** Danger**Pictograms:**

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Hazard statements

H314	Causes severe skin burns and eye damage.
H332	Harmful if inhaled.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statements

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.

Additional advice on labelling

Warning - substance not yet tested completely.

2.3. Other hazards

No information available.

SECTION 3: Composition/information on ingredients
3.1. Substances
Chemical characterization

Trifluoroacetic acid

Sum formula:	CF ₃ COOH
Molecular weight:	114,02 g/mol

Hazardous components

CAS No	Chemical name	Quantity
	EC No	
	Index No	
	REACH No	
	Classification (GB CLP Regulation)	
76-05-1	TFA	<= 100 %
	200-929-3	
	Acute Tox. 4, Skin Corr. 1A, Aquatic Chronic 3; H332 H314 H412	

Full text of H and EUH statements: see section 16.

Specific Conc. Limits, M-factors and ATE

CAS No	EC No	Chemical name	Quantity
		Specific Conc. Limits, M-factors and ATE	
76-05-1	200-929-3	TFA	<= 100 %
		inhalation: ATE = 11 mg/l (vapours); inhalation: ATE = 1,5 mg/l (dusts or mists)	

SECTION 4: First aid measures
4.1. Description of first aid measures
General information

Remove affected person from the danger area and lay down. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible). First aider: Pay attention to self-protection!

After inhalation

Provide fresh air. When in doubt or if symptoms are observed, get medical advice. Remove casualty to fresh air and keep warm and at rest. In case of irregular breathing or respiratory arrest provide artificial respiration.

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Call a physician immediately.

After contact with skin

Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention. After contact with skin, wash immediately with plenty of water. Remove contaminated, saturated clothing immediately. Put victim at rest, cover with a blanket and keep warm. Wash contaminated clothing prior to re-use.

After contact with eyes

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

After ingestion

Rinse mouth immediately and drink plenty of water. Adverse human health effects and symptoms: Gastric perforation

Do NOT induce vomiting. In case of irregular breathing or respiratory arrest provide artificial respiration.

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

Following inhalation: Lung irritation. Coughing. shortage of breath. Pulmonary oedema. Respiratory complaints.

After skin contact: Causes severe skin burns and eye damage. erythema (redness). Immediate medical treatment required because corrosive injuries that are not treated are hard to cure.

after ingestion: Causes severe burns. Allergic anaphylactic shock. Pulmonary oedema. vomiting. shortage of breath. Coughing.

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

Treat symptomatically.

SECTION 5: Firefighting measures**5.1. Extinguishing media****Suitable extinguishing media**

Co-ordinate fire-fighting measures to the fire surroundings. Dry extinguishing powder. Carbon dioxide (CO₂). Sand.

Unsuitable extinguishing media

Never use water.

5.2. Special hazards arising from the substance or mixture

The product itself does not burn. Reacts violently with water. In case of fire may be liberated: Gases/vapours, toxic May cause strong formation of hydrogen by contact with amphoteric metals (e.g. alumina, lead, zinc) - danger of explosion.

Thermal decomposition can lead to the escape of irritating gases and vapours.

In case of fire may be liberated: Carbon dioxide (CO₂). Carbon monoxide (CO). Hydrogen fluoride (HF).

5.3. Advice for firefighters

Wear a self-contained breathing apparatus and chemical protective clothing. Full protection suit.

Additional information

Usual measures for fire prevention.

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures****General advice**

Provide adequate ventilation. Do not breathe gas/fumes/vapour/spray. Avoid contact with skin, eyes and clothes. Use personal protection equipment. Provide adequate ventilation. Wear personal protection equipment. Stop and contain spill/release if it can be done safely. If this cannot be done, allow fire to burn under control. Wear a self-contained breathing apparatus and chemical protective clothing. Evacuate area. Remove persons to safety.

Evacuate the danger area, observe emergency procedures, consult an expert.

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6.2. Environmental precautions

Do not allow to enter into surface water or drains. Do not allow to enter into surface water or drains. In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

6.3. Methods and material for containment and cleaning up**Other information**

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents). Treat the recovered material as prescribed in the section on waste disposal. Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents). Do not allow to enter into surface water or drains. Repair leaks immediately. During dilution or dissolving in water, strong heating-up always takes place. Waste for disposal is to be classified and labelled. This material and its container must be disposed of in a safe way.

6.4. Reference to other sections

Safe handling: see section 7

Personal protection equipment: see section 8

Disposal: see section 13 Treat the recovered material as prescribed in the section on waste disposal.

SECTION 7: Handling and storage**7.1. Precautions for safe handling****Advice on safe handling**

If handled uncovered, arrangements with local exhaust ventilation have to be used. Do not breathe gas/fumes/vapour/spray. If handled uncovered, arrangements with local exhaust ventilation should be used if possible. Do not breathe gas/fumes/vapour/spray. Transfer and handle product only in closed systems. Use only in well-ventilated areas. Keep away from heat. Thermal decomposition can lead to the escape of irritating gases and vapours. Transfer substance using encapsulated system, e.g. using a drum pump.

Advice on protection against fire and explosion

Usual measures for fire prevention.

Advice on general occupational hygiene

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat or drink. Avoid contact with skin, eyes and clothes. When using do not eat, drink or smoke. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities**Requirements for storage rooms and vessels**

Keep container tightly closed. Keep locked up. Store in a place accessible by authorized persons only. Provide adequate ventilation as well as local exhaust at critical locations. Keep container tightly closed in a cool, well-ventilated place. Keep/Store only in original container. Store in a place accessible by authorized persons only. Keep away from heat.

Product is hygroscopic. Store under dry inert gas.

Recommended storage temperature: room temperature

7.3. Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8: Exposure controls/personal protection**8.1. Control parameters****Additional advice on limit values**

To date, no national critical limit values exist.

8.2. Exposure controls

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**Appropriate engineering controls**

If handled uncovered, arrangements with local exhaust ventilation have to be used. Do not breathe gas/fumes/vapour/spray. If handled uncovered, arrangements with local exhaust ventilation should be used if possible. Do not breathe gas/vapour/aerosol. If local exhaust ventilation is not possible or not sufficient, the entire working area must be ventilated by technical means.

Individual protection measures, such as personal protective equipment**Eye/face protection**

Suitable eye protection: goggles. Wear suitable protective clothing, gloves and eye/face protection. Avoid contact with skin, eyes and clothes.

Hand protection

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. Wear suitable gloves. Suitable gloves type neoprene. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

Skin protection

Wear suitable protective clothing. For the protection against direct skin contact, body protective clothing is essential (in addition to the usual working clothes). Suitable material: Apron, Boots, neoprene. Provide eye shower and label its location conspicuously. Remove contaminated, saturated clothing immediately. Wash contaminated clothing prior to re-use. When using do not eat, drink or smoke. Wash hands before breaks and after work.

Respiratory protection

In case of inadequate ventilation wear respiratory protection. If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. gas filtering equipment (EN 141). Filtering device with filter or ventilator filtering device of type: B

Environmental exposure controls

Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Physical state:	liquid
Colour:	colourless
Odour:	stinging

Changes in the physical state

Melting point/freezing point:	-15 °C
Boiling point or initial boiling point and boiling range:	72 °C
Sublimation point:	not determined
Flash point:	No data available

Flammability

Solid/liquid:	No data available
Gas:	No data available

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Explosive properties

Not classified as explosive.

Lower explosion limits: No data available
Upper explosion limits: No data available
Auto-ignition temperature: No data available

Self-ignition temperature

Solid: not applicable
Gas: not applicable

Decomposition temperature: not determined

pH-Value (at 20 °C): 1

Viscosity / dynamic:
(at 20 °C) 0,91 mPa·s

Viscosity / kinematic: not determined

Flow time: not determined

Water solubility: not determined

Solubility in other solvents

not determined

Partition coefficient n-octanol/water: log Pow = -2,1

Vapour pressure:
(at 20 °C) 141 hPaDensity (at 20 °C): 1,48 g/cm³

Bulk density: not applicable

Relative vapour density: 3,94

9.2. Other information**Information with regard to physical hazard classes**

Sustaining combustion: No data available

Oxidizing properties
Non-combustible liquids**Other safety characteristics**

Solid content: not determined

Evaporation rate: not determined

Further Information

Reacts violently with water.

SECTION 10: Stability and reactivity**10.1. Reactivity**

Possibility of hazardous reactions. Corrosive to metals:

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Reacts violently with water. May cause strong formation of hydrogen by contact with amphoteric metals (e.g. alumina, lead, zinc) - danger of explosion. Violent reaction with: Alkalis (alkalis).

Risk of explosion with: Lithiumaluminiumhydrid (LiAlH₄), Hydrides**10.4. Conditions to avoid**

Protect from moisture.

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Keep away from heat.

Thermal decomposition can lead to the escape of irritating gases and vapours.

10.5. Incompatible materials

Metal, base

Oxidizing agents. Water strong alkalis.

10.6. Hazardous decomposition products

Thermal decomposition can lead to the escape of irritating gases and vapours.

In case of fire may be liberated: Carbon dioxide (CO₂). Carbon monoxide (CO). Fluorhydric acid.**Further information**

In case of fire: See chapter 5.

SECTION 11: Toxicological information**11.1. Information on hazard classes as defined in GB CLP Regulation****Toxicokinetics, metabolism and distribution**

No data available

Acute toxicity

Harmful if inhaled.

CAS No	Chemical name				
	Exposure route	Dose	Species	Source	Method
76-05-1	TFA				
	inhalation vapour	ATE 11 mg/l			
	inhalation dust/mist	ATE 1,5 mg/l			

Irritation and corrosivity

Causes severe skin burns and eye damage.

Causes serious eye damage.

Sensitising effects

Based on available data, the classification criteria are not met.

Carcinogenic/mutagenic/toxic effects for reproduction

Based on available data, the classification criteria are not met.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

STOT-single exposure

Based on available data, the classification criteria are not met.

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.

Specific effects in experiment on an animal

No data available

Additional information on tests

Classification according to Regulation (EC) No 1272/2008 [CLP]: Health hazard properties

Practical experience

No data available

11.2. Information on other hazards**Other information**

liver - Toxicity - Practical experience/human evidence

Handle in accordance with good industrial hygiene and safety practice.

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Further information

RTECS: AJ9625000

Caution! To the best of our knowledge the toxicological properties of this material have not been thoroughly investigated.

SECTION 12: Ecological information
12.1. Toxicity

CAS No	Chemical name					
	Aquatic toxicity	Dose	[h] [d]	Species	Source	Method
76-05-1	TFA					
	Acute fish toxicity	LC50 mg/l	>1200	96 h	Danio rerio (zebrafish)	
	Acute algae toxicity	ErC50	5 mg/l	72 h	Selenastrum capricornutum	
	Acute crustacea toxicity	EC50	55 mg/l	48 h	Daphnia magna (Big water flea)	

12.3. Bioaccumulative potential

On the basis of existing data about the elimination/degradation and bioaccumulation potential longer term damage to the environment is unlikely.

Partition coefficient n-octanol/water

CAS No	Chemical name	Log Pow
76-05-1	TFA	-2,1

12.4. Mobility in soil

If product enters soil, it will be mobile and may contaminate groundwater.

12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of UK REACH.

No data available

12.6. Endocrine disrupting properties

This substance does not have endocrine disrupting properties with respect to non-target organisms.

12.7. Other adverse effects

No information available.

Further information

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

Warning - substance not yet tested completely.

SECTION 13: Disposal considerations
13.1. Waste treatment methods
Disposal recommendations

Dispose of waste according to applicable legislation. Dispose of waste according to applicable legislation.

Consult the appropriate local waste disposal expert about waste disposal.

Handle contaminated packages in the same way as the substance itself.

Contaminated packaging

Non-contaminated packages may be recycled. Handle contaminated packages in the same way as the substance itself.

SECTION 14: Transport information

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Land transport (ADR/RID)

14.1. UN number or ID number: UN 2699
14.2. UN proper shipping name: TRIFLUOROACETIC ACID
14.3. Transport hazard class(es): 8
14.4. Packing group: I
 Hazard label: 8



Classification code: C3
 Limited quantity: 0
 Excepted quantity: E0
 Transport category: 1
 Hazard No: 88
 Tunnel restriction code: E

Inland waterways transport (ADN)

14.1. UN number or ID number: UN 2699
14.2. UN proper shipping name: TRIFLUOROACETIC ACID
14.3. Transport hazard class(es): 8
14.4. Packing group: I
 Hazard label: 8



Classification code: C3
 Limited quantity: 0
 Excepted quantity: E0

Marine transport (IMDG)

14.1. UN number or ID number: UN 2699
14.2. UN proper shipping name: TRIFLUOROACETIC ACID
14.3. Transport hazard class(es): 8
14.4. Packing group: I
 Hazard label: 8



Special Provisions: -
 Limited quantity: 0
 Excepted quantity: E0
 EmS: F-A, S-B

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number or ID number: UN 2699
14.2. UN proper shipping name: TRIFLUOROACETIC ACID
14.3. Transport hazard class(es): 8
14.4. Packing group: I
 Hazard label: 8



Limited quantity Passenger: Forbidden

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Passenger LQ:	Forbidden	
Excepted quantity:	E0	
IATA-packing instructions - Passenger:		850
IATA-max. quantity - Passenger:		0.5 L
IATA-packing instructions - Cargo:		854
IATA-max. quantity - Cargo:		2.5 L

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS: No

14.6. Special precautions for user

Warning: strongly corrosive.

14.7. Maritime transport in bulk according to IMO instruments

not applicable

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU regulatory information**

Restrictions on use (REACH, annex XVII):

Entry 3

2010/75/EU (VOC):	100 % (1480 g/l)
2004/42/EC (VOC):	100 % (1480 g/l)
Information according to 2012/18/EU (SEVESO III):	Not subject to 2012/18/EU (SEVESO III)

Additional information

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)

National regulatory information

Employment restrictions:	Observe restrictions to employment for juveniles according to the 'juvenile work protection guideline' (94/33/EC).
Water hazard class (D):	2 - obviously hazardous to water

15.2. Chemical safety assessment

For this substance a chemical safety assessment has not been carried out.

SECTION 16: Other information**Abbreviations and acronyms**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%

Relevant H and EUH statements (number and full text)

H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H332	Harmful if inhaled.
H412	Harmful to aquatic life with long lasting effects.

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Further Information

The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights. The receiver of our product is singularly responsible for adhering to existing laws and regulations. Warning - substance not yet tested completely.

The product is intended for research, analysis and scientific education.

The receiver of our product is singularly responsible for adhering to existing laws and regulations.

The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights.

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.