



## SAFETY DATA SHEET

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

- 1.1. Product identifier:  
**sec-BUTYL CHLOROFORMATE**
- IUPAC name: sec-Butyl chloroformate  
Synonym: sec-Butyl carbonochloridate  
CAS number: 17462-58-7  
EC number: 241-475-6  
Registration number: not available.
- 1.2. Relevant identified uses of the substance and uses advised against:  
Organic synthesis intermediate for industrial use.
- 1.3. Details of the supplier of the safety data sheet:  
**FRAMOCHEM FRENCH-HUNGARIAN FINE CHEMICALS LTD.**  
3700 Kazincbarcika, Szerviz út 5, Pf. 504  
Telephone: +36 (48) 311-991  
Fax: +36 (48) 512-162
- 1.3.1. Responsible person: -  
E-mail: info@framochem.hu
- 1.4. Emergency telephone number: **Public Toxicological Health Service (ETTSZ)**  
1096 Budapest, Nagyvárad tér 2.  
Tel.: 06 1 476 6464, 06 80 201 199 (0-24 h)

### SECTION 2: HAZARDS IDENTIFICATION

- 2.1. Classification of the substance:
- Classification according to Regulation 1272/2008/EC (CLP):  
Flam. Liq. 3 – H226  
Skin Corr. 1B – H314  
Acute Tox. (inhalative) 3 – H331

**Warning H statements:**

**H226** – Flammable liquid and vapour.  
**H314** – Causes severe skin burns and eye damage.  
**H331** – Toxic if inhaled.

Classification according to Directive 67/548/EEC:

C; Corrosive - R34  
T; Toxic – R23  
R10

**R phrases** referring to the hazards/risks:

**R 10** - Flammable.  
**R 23** - Toxic by inhalation  
**R 34** - Causes burns.

# FramoChem

A VanDeMark Company

## 2.2. Label elements

IUPAC name: sec-Butyl chloroformate  
CAS number: 17462-58-7  
EC number: 241-475-6



**DANGER**

### Warning **H statements:**

**H226** – Flammable liquid and vapour.  
**H314** – Causes severe skin burns and eye damage.  
**H331** – Toxic if inhaled.

### Precautionary **P statements:**

**P210** – Keep away from heat, sparks, open flame and hot surfaces. No smoking.  
**P280** – Wear protective gloves/protective clothing/eye protection/face protection.  
**P284** – Wear respiratory protection.  
**P304 + P340** – IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
**P303 + P361 + P353** – IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
**P310** – Immediately call a POISON CENTER or doctor/physician.  
**P403** – Store in a well-ventilated place.

## 2.3. Other hazards:

The substance does not meet the PBT criteria according to Annex XIII of Regulation 1907/2006/EC.  
Information concerning specific hazards for human and environment: see Section 11 and 12.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substance

IUPAC name: sec-Butyl chloroformate  
Synonym: sec-Butyl carbonochloridate; Carbonochloridacid 1-methylpropylester  
CAS number: 17462-58-7  
EC number: 241-475-6  
Formula: C<sub>5</sub>H<sub>9</sub>ClO<sub>2</sub>  
Molar weight: 136.6 g/mol  
Purity: > 99 %

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures:

**GENERAL INFORMATION:** Move victim to hospital or obtain medical attention and show him this safety data sheet.  
**INFORMATION TO THE PHYSICIAN:** life threatening poisoning can happen, pulmonary edema may occur.  
**IN CASE OF INGESTION:**

# FramoChem

A VanDeMark Company

Measures:

- Obtain immediate medical attention and show him the label or this safety data sheet.
- Do not give the victim anything to eat or drink, and do not induce vomiting if the victim is unconscious.

IN CASE OF INHALATION:

Measures:

- Take the victim into fresh air, loosen his clothes and let him rest.
- If the victim is unconscious and breathing, place him into recovery position.
- Obtain immediate medical attention and show him the label or this safety data sheet.

IN CASE OF SKIN CONTACT:

Measures:

- Remove the contaminated clothes and wash them before re-use.
- Wash the skin surface with plenty of water and soap (for 15 minutes).
- If symptoms occur, obtain immediate medical attention and show him the label.

IN CASE OF EYE CONTACT:

Measures:

- In case of contact with eyes flush with water while moving the eyeballs and holding eyelids apart (for at least 15 minutes).
- In case of persistent symptoms, obtain medical help and show him the label.

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

See section 11 for information on health effects and symptoms.

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

See section 11 for information on health effects and symptoms.

## SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing media:

5.1.1. Suitable extinguishing media:

Powder, carbon dioxide, foam.

5.1.2. Unsuitable extinguishing media:

Avoid the use and contact with water.

It is forbidden to direct the water jet into the fire.

5.2. Special hazards arising from the substance or mixture:

Flammable liquid and vapour.

Hazardous decomposition products:

Smoke and other combustion products (carbon dioxide, carbon monoxide and hydrogen chloride).

The inhalation of such combustion products can cause serious adverse effects on health!

5.3. Advise for fire fighters

Wear appropriate full protective clothing and self-contained breathing apparatus (self-rescue breathing apparatus). These means can protect from the skin and eye contact and from the inhalation of the hazardous gases and smoke.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:

6.1.1. For non-emergency personnel:

Keep unprotected people away, allow only well trained experts wearing suitable protective clothing to abide in the field of accident.

6.1.2. For emergency responders:

Evacuate the unauthorized persons from the place of the accident. Remove all ignition sources from the affected area. Close the designated area. Ensure adequate ventilation.

6.2. Environmental precautions:

Dispose of spillage and waste (product/packaging) in accordance with all applicable environmental laws. Do not allow to enter sewers/soil/surface or ground water. Notify the respective authorities in accordance with local law in the case of environmental pollution immediately.

6.3. Methods and material for containment and cleaning up:

Collect the spilled material with inert, non-combustible, mineral absorbent (sand, earth, and perlite), then place into a suitable, closed, properly labelled chemical waste container for disposal. During disposal wear suitable personal protective equipment.

6.4. Reference to other sections:

For further and detailed information see section 8 and 13.

## SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling:

# FramoChem

A VanDeMark Company

Observe conventional hygiene precautions.  
 Avoid contact with skin, eyes and clothing, avoid inhalation.  
 Do not eat, drink and smoke in the workplace.  
 Use adequate personal protective equipment (see section 8).  
 The contaminated clothes should be removed immediately and should be cleaned before re-use.  
 After the handling of the product and before breaks or before eating wash your hands, after the work hours thorough washing (showering) is required.

Technical measures:

Ensure adequate ventilation (general ventilation and local suction).

Precautions against fire and explosion:

Keep away from heat, sparks, open flame and hot surfaces. No smoking.

7.2. Conditions for safe storage, including any incompatibilities:

Technical measures and storage condition:

Keep in original, closed and appropriately labelled container.

The place of storage has to be properly ventilated and cleanable.

Store in a heat-protected, cool, dry (protected from water and humidity), well-ventilated place up to 0 °C.

Follow all instructions on the label.

Incompatible materials: transition metals, water, alkalis, alcohols, amines.

Packaging material: metal container lined with polyethylene.

7.3. Specific end use(s):

No specific instructions available.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Exposure limit values:

The substance is not regulated with exposure limit value.

DNEL		Routes of exposure	Exposure frequency:	Remarks:
Worker	Consumer			
no data available	no data available	Dermal	Short term (acute) Long term (repeated)	no data available
no data available	no data available	Inhalative	Short term (acute) Long term (repeated)	no data available
no data available	no data available	Oral	Short term (acute) Long term (repeated)	no data available

PNEC			Exposure frequency:	Remarks:
Water	Soil	Air		
no data available	no data available	no data available	Short term (single use) Long term (continuous)	no data available
no data available	no data available	no data available	Short term (single use) Long term (continuous)	no data available
no data available	no data available	no data available	Short term (single use) Long term (continuous)	no data available

8.2. Exposure controls:

In case of a hazardous material with no controlled concentration limit it is the employer's duty to keep concentration levels down to a minimum achievable by existing scientific and technological means, where the hazardous substance poses no harm to workers.

8.2.1 Appropriate engineering controls

In pursuance of work is proper foresight needed to avoid spilling onto clothes and floors and to avoid contact with eyes and skin.

Ensure adequate ventilation, especially in closed areas.

Do not eat or smoke during the processing.

Wash thoroughly after the work hours.

In the vicinity of the workplace safety shower and eye wash fountain has to be installed.

8.2.2 Individual protection measures, such as personal protective equipment:

- Eye/face protection: use adequate protective goggles/ protective mask according to EN 166.

# FramoChem

A VanDeMark Company

2. Skin protection:
    - a. Hand protection: use adequate protective gloves according to EN 374.
    - b. Other: use adequate acid resistant protective clothes according to EN ISO 6529.
  3. Respiratory protection: use adequate respirator (for organic vapours) according to EN 136, 141.
  4. Thermal hazard: none known.
- 8.2.3. Environmental exposure controls:  
No specific prescription.

**The requirements detailed in Section 8 assume skilled work under normal conditions and usage of the product for appropriate aims. If conditions differ from normal or work is carried out under extreme conditions an expert's advice should be sought out before deciding upon further protective measures.**

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties:

Parameter		Test method:	Remarks:
1. <b>Appearance:</b>	colourless liquid		
2. <b>Odour:</b>	pungent		
3. Odour threshold:	no data available		
4. pH value:	no data available		
5. Melting point/ freezing point:	no data available		
6. Initial boiling point/boiling range:	121 °C		
7. Flash point:	35.6 °C		
8. Evaporation rate:	no data available		
9. Flammability:	no data available		
10. Upper/lower flammability or explosive limits:	no data available		
11. Vapour pressure:	1 kPa (20 °C) 13 kPa (70 °C)		
12. Vapour density:	4.7	air = 1	
13. Relative density:	1.0493 g/cm <sup>3</sup>	20 °C	
14. Solubility(ies):	in case of contact with water, decomposes soluble in common solvents		
15. Partition coefficient: n-octanol/water:	not applicable		
16. Self-ignition temperature:	no data available		
17. Degradation temperature:	102 °C (ATD) E =240 J/g		
18. Viscosity:	no data available		
19. Explosive properties:	no data available		
20. Oxidizing properties:	no data available		

### 9.2. Other information:

No data available.

## SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:  
Unstable at room temperature, store under 0 °C.
- 10.2. Chemical stability:  
Stable at room temperature.
- 10.3. Possibility of hazardous reactions:  
In case of contact with water, decomposes.
- 10.4. Conditions to avoid:  
Contact with water. Keep away from ignition sources.
- 10.5. Incompatible materials:  
Metals, bases, water, amines and alcohol.
- 10.6. Hazardous decomposition products:  
In case of thermal decomposition: carbon dioxide, carbon monoxide and hydrogen chloride are formed.

## SECTION 11: TOXICOLOGICAL INFORMATION

# FramoChem

A VanDeMark Company

## 11.1. Information on toxicological effects:

Acute toxicity: toxic if inhaled.  
Skin corrosion/irritation: causes severe burns.  
Serious eye damage/eye irritation: causes serious eye damage.  
Respiratory or skin sensitisation: none known.  
Germ cell mutagenicity: none known.  
Carcinogenicity: none known.  
Reproductive toxicity: none known.  
STOT-single exposure: none known.  
STOT-repeated exposure: none known.  
Aspiration hazard: none known.

11.1.1. For substances subject to registration, brief summaries of the information derived from the test conducted:  
No data available.

11.1.2. Relevant toxicological properties of the hazardous substances:

### **Acute toxicity (LD50):**

LD<sub>50</sub> (oral, rat): 700 mg/kg.

**Irritation:** irritant, corrosive, may cause burning.

**Sensitization:** none known.

### **Subacute and chronic toxicity:**

Symptoms by intensive or prolonged exposition: none known.

11.1.3. Information on likely routes of exposure:

Ingestion, inhalation, skin contact, eye contact.

11.1.4. Symptoms related to the physical, chemical and toxicological characteristics:

### **Acute effects:**

Ingestion: mucous membrane irritation and burning is likely.

Inhalation: the inhalation of the vapours may cause mucous membrane irritation. May cause burning in the respiratory tract. May cause pulmonary edema.

Skin contact: corrosive substance, causes skin irritation.

Eye contact: causes serious eye damages.

11.1.5. Delayed and immediate effects as well as chronic effects from short and long-term exposure:

Causes severe skin burns and eye damage.

Toxic if inhaled.

11.1.6. Interactive effects:

No data available.

11.1.7. Absence of specific data:

No information.

11.1.8. Other information:

No data available.

## **SECTION 12: ECOLOGICAL INFORMATION**

12.1. Toxicity:

No data available.

12.2. Persistence and degradability

In case of contact with water, decomposes. By hydrolyze: hydrochloric acid, CO<sub>2</sub> and Sec-Butyl alcohol (water solubility: 12.5 w/w %). The residues are dispersed, dissolved in water or evaporated from the surface of the water.

Sec-Butyl alcohol: Fast / immediate biodegradation.

12.3. Bioaccumulation potential:

No data available.

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This substance does not meet the criteria of PBT or vPvB.

12.6. Other adverse effects:

No data available.

## **SECTION 13: DISPOSAL CONSIDERATIONS**

13.1. Waste treatment methods:

Disposal according to the local regulations.

13.1.1. Information regarding the disposal of the product:

The product can be incinerated in a chemical incinerator equipped with an afterburner and scrubber.

# FramoChem

A VanDeMark Company

**European Waste Code:**

No appropriate EWC code can be given for the substance, since the identification of the proper code can be done with the method of use defined by the user of the substance. The European waste code number has to be determined after a discussion with a specialist dealing with waste disposal.

- 13.1.2. **Information regarding the disposal of the packaging:**  
According to the consideration regarding the product.  
The contaminated packaging should be cleaned with alkaline solution.
- 13.1.3. **Physical/chemical properties that may affect waste treatment options shall be specified:**  
None known.
- 13.1.4. **Sewage disposal:**  
None known.
- 13.1.5. **Special precautions for any recommended waste treatment:**  
No data available.

## SECTION 14: TRANSPORT INFORMATION

- 14.1. **UN Number:**  
2742
- 14.2. **UN proper shipping name:**  
ADR/RID: CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (s-Butyl chloroformate)  
IMDG: CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (s-Butyl chloroformate)  
IATA: CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (s-Butyl chloroformate)
- 14.3. **Transport hazard class(es)**  
ADR/RID: 6.1.TFC  
Labels: 6.1 + 3 + 8  
IMDG: 6.1  
IATA: 6.1
- 14.4. **Packaging group**  
ADR/RID: II  
IMDG: II  
IATA: II
- 14.5. **Environmental hazard**  
ADR/RID: no  
IMDG: no  
IATA: none
- 14.6. **Special precautions for user:**  
**Refrigerated transport!**
- 14.7. **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:**  
Not applicable.

## SECTION 15: REGULATORY INFORMATION

- 15.1. **Safety, health and environmental regulations/legislation specific for the substance or mixture:**  
REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC  
  
REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006  
  
COMMISSION REGULATION (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- 15.2. **Chemical safety assessment:** no information available.

## SECTION 16: OTHER INFORMATION

Information regarding the revision of the safety data sheet:



# FramoChem

A VanDeMark Company

The safety data sheet has been revised according to Regulation 453/2010/EU (Section 1-16).

There is a change in the hazard classification compared to the previous version.

Full text of the abbreviations in the safety data sheet:

DNEL: Derived no effect level. PNEC: Predicted no effect concentration. CMR effects: carcinogenicity, mutagenicity and toxicity for reproduction. PBT: Persistent, bioaccumulative and toxic. vPvB: very persistent and very bioaccumulative. n.d.: not defined. n.a.: not applicable.

Data sources: previous version of the safety data sheet (13. 02. 2015.)

Relevant R-Phrases (number and full text) of Section 2 and 3:

**R 10** - Flammable.

**R 23** - Toxic by inhalation

**R 34** - Causes burns.

Relevant H-Phrases (number and full text) of Section 2 and 3:

**H226** - Flammable liquid and vapour.

**H314** - Causes severe skin burns and eye damage.

**H331** - Toxic if inhaled.

Training advice: no data available.

This safety data sheet had been prepared on the basis of information provided by the manufacturer/supplier and conform to the relevant regulations.

The information, data and recommendations contained herein are provided in good faith, obtained from reliable sources and believed to be true and accurate as of the date issued; however, no representation is made as to the comprehensiveness of the information. The SDS shall be used only as a guide for handling the product; in the course of handling and using the product other considerations may arise or be required.

Users are cautioned to determine the appropriateness and applicability of the above information to their particular circumstances and purposes and assume all risk associated with the use of this product. It is the responsibility of the user to fully comply with local, national and international regulations concerning the use of this product.

Safety data sheet was prepared by: ToxInfo Ltd.

Professional help regarding the explanation of the safety data sheet:  
+36 70 335 8480; info@msds-europe.hu

Download of safety data sheet:

