

**1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING****1.1 Product identifiers**Product name: **2-CHLOROBUTANE**CAS-No.: **78-86-4**Product Number: **A66989****1.2 Relevant identified uses of the substance or mixture and uses advised against**

Identified uses: Laboratory chemicals, Manufacture of substances

**1.3 Details of the supplier of the safety data sheet**Company : Philip Harris Ltd., 2 Gregory Street, Hyde, Cheshire, SK14 4HR,  
UNITED KINGDOM

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Email: enquiries@philipharris.co.uk

**1.4 Emergency telephone number**Emergency Phone #: **+44 (0)845 1200 506****2. HAZARDS IDENTIFICATION****2.1 Classification of the substance or mixture**

According to Regulation (EC) No1272/2008: Flammable liquids (Category 2)

According to European Directive 67/548/EEC as amended: Highly flammable.

**2.2 Label elements**

Pictogram

Signal word **Danger****Hazard statement(s)**

H225 Highly flammable liquid and vapour.

**Precautionary statement(s)**

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

**Hazard symbol(s)**

F Highly flammable

**R-phrases(s)**

R11 Highly flammable.

**S-phrases(s)**

S 7/9 Keep container tightly closed and in a well-ventilated place.

S16 Keep away from sources of ignition - No smoking.

S29 Do not empty into drains.

**2.3 Other hazards** – no data available

**3. COMPOSITION/INFORMATION ON INGREDIENTS****3.1 Substances**

**2-Chlorobutane** (*Synonyms : sec-Butyl chloride*)

Formula: **CH<sub>3</sub>CH<sub>2</sub>CHClCH<sub>3</sub>**

Molecular Weight: **92.57g/mol**

CAS-No.: **78-86-4**

EC-No.: **201-151-7**

**4. FIRST AID MEASURES****4.1 Description of first aid measures**

**General advice:** Consult a physician. Show this safety data sheet to the doctor in attendance.

**If inhaled:** If breathed in, move person into fresh air. If not breathing, give artificial respiration.

**In case of skin contact:** Wash off with soap and plenty of water.

**In case of eye contact:** Flush eyes with water as a precaution.

**If swallowed:** Do NOT induce vomiting. Never give anything by mouth to an unconscious person.

Rinse mouth with water.

**4.2 Most important symptoms and effects, both acute and delayed:** no data available

**4.3 Indication of immediate medical attention and special treatment needed:** no data available

**5. FIRE-FIGHTING MEASURES****5.1 Extinguishing media**

**Suitable extinguishing media:** For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

**5.2 Special hazards arising from the substance or mixture:** no data available

**5.3 Precautions for fire-fighters:** Wear self contained breathing apparatus for fire fighting if necessary.

**5.4 Further information:** Use water spray to cool unopened containers.

## **6. ACCIDENTAL RELEASE MEASURES**

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

Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

### **6.2 *Environmental precautions:***

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

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

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

### **6.4 *Reference to other sections:***

For disposal see section 13.

## **7. HANDLING AND STORAGE**

### **7.1 *Precautions for safe handling***

Avoid inhalation of vapour or mist. Keep away from sources of ignition. Take measures to prevent the build up of electrostatic charge.

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

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in cool place.

### **7.3 *Specific end uses***

no data available

## **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**8.1 Control parameters:** Contains no substances with occupational exposure limit values.

### **8.2 Exposure controls**

#### **Appropriate engineering controls**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

#### **Personal protective equipment**

##### **Eye/face protection**

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

##### **Skin protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

##### **Body Protection**

Impervious clothing, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

##### **Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

- a) Appearance:                    **Form:** Liquid                    **Colour:** Colourless
- b) Odour:    no data available
- c) Odour Threshold:                            no data available
- d) pH:    no data available
- e) Melting/freezing point:                   -140 °C                    Melting point/range: no data available
- f) Initial boiling point and boiling range: 68 - 70 °C
- g) Flash point:                                    -15 °C - closed cup
- h) Evaporation rate:                            no data available
- i) Flammability (solid, gas):                  no data available
- j) Upper/lower flammability or explosive limits: no data available
- k) Vapour pressure:                            no data available
- l) Vapour density:                                no data available
- m) Relative density:                            0.873 g/cm<sup>3</sup> at 25 °C
- n) Water solubility:                            no data available
- o) Partition coefficient: n-octanol/water: no data available
- p) Autoignition temperature: no data available
- q) Decomposition temperature: no data available
- r) Viscosity:                                        no data available
- s) Explosive properties:                        no data available
- t) Oxidizing properties:                        no data available

### 9.2 Other safety information

no data available

## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

no data available

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

no data available

### 10.4 Conditions to avoid

Heat, flames and sparks. Extremes of temperature and direct sunlight.

### 10.5 Incompatible materials

Strong oxidizing agents, Strong bases

### 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas

## **11. TOXICOLOGICAL INFORMATION**

### **11.1 Information on toxicological effects**

#### **Acute toxicity**

LD50 Oral - rat - 17,440 mg/kg

LD50 Dermal - rabbit - 17,440 mg/kg

#### **Skin corrosion/irritation**

no data available

#### **Serious eye damage/eye irritation**

no data available

#### **Respiratory or skin sensitization**

no data available

#### **Germ cell mutagenicity**

no data available

#### **Carcinogenicity**

Carcinogenicity - mouse – Intraperitoneal: Tumorigenic: Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration: Tumours

#### **Reproductive toxicity**

no data available

#### **Specific target organ toxicity - single exposure**

no data available

#### **Specific target organ toxicity - repeated exposure**

no data available

#### **Aspiration hazard**

no data available

#### **Potential health effects**

**Inhalation** May be harmful if inhaled. May cause respiratory tract irritation.

**Ingestion** May be harmful if swallowed.

**Skin** May be harmful if absorbed through skin. May cause skin irritation.

**Eyes** May cause eye irritation.

#### **Signs and Symptoms of Exposure**

no data available

#### **Additional Information**

RTECS: EJ6475000

## 12. ECOLOGICAL INFORMATION

**12.1 Toxicity:** no data available

**12.2 Persistence and degradability:** no data available

**12.3 Bioaccumulative potential:** no data available

**12.4 Mobility in soil:** no data available

**12.5 Results of PBT and vPvB assessment:** no data available

**12.6 Other adverse effects:** no data available

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

**Product:** Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging:** Dispose of as unused product.

## 14. TRANSPORT INFORMATION

### 14.1 UN-Number

ADR/RID: 1127 IMDG: 1127 IATA: 1127

### 14.2 UN proper shipping name

ADR/RID: CHLOROBUTANES

IMDG: CHLOROBUTANES

IATA: CHLOROBUTANES

### 14.3 Transport hazard class(es)

ADR/RID: 3 IMDG: 3 IATA: 3

### 14.4 Packaging group

ADR/RID: II IMDG: II IATA: II

### 14.5 Environmental hazards

ADR/RID: no IMDG Marine pollutant: no IATA: no

**14.6 Special precautions for users:** EMS-No: F-E, S-D

## 15. REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

## 16. OTHER INFORMATION

Flam. Liq. Flammable liquids; H225 Highly flammable liquid and vapour; F Highly flammable; R11 Highly flammable.