

## Safety data sheet Arsine

Creation date : 28.01.2005  
Revision date : 31.08.2011

Version : 1.2

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

#### 1.1. Product identifier

##### Product name

Arsine

EC No (from EINECS): 232-066-3

CAS No: 7784-42-1

Index-Nr. 033-006-00-7

**Chemical formula** AsH<sub>3</sub>

**REACH Registration number:**

Not available.

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

##### Relevant identified uses

Industrial and professional. Perform risk assessment prior to use.

##### Uses advised against

Consumer use.

#### 1.3. Details of the supplier of the safety data sheet

##### Company identification

BOC, Priestley Road, Worsley, Manchester M28 2UT

**E-Mail Address** ReachSDS@boc.com

#### 1.4. Emergency telephone number

**Emergency phone numbers (24h):** 0800 111 333

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)

Press. Gas (Liquefied gas) - Contains gas under pressure; may explode if heated.

Flam. Gas 1 - Extremely flammable gas.

Acute Tox. 1 - Fatal if inhaled.

STOT RE 2 - May cause damage to organs through prolonged or repeated exposure.

Aquatic Acute 1 - Very toxic to aquatic life.

Aquatic Chronic 1 - Very toxic to aquatic life with long lasting effects.

##### Classification acc. to Directive 67/548/EEC & 1999/45/EC

F+; R12 | T+; R26 | Xn; R48/20 | N; R50/53

Extremely flammable.

Very toxic by inhalation.

Harmful: danger of serious damage to health by prolonged exposure through inhalation.

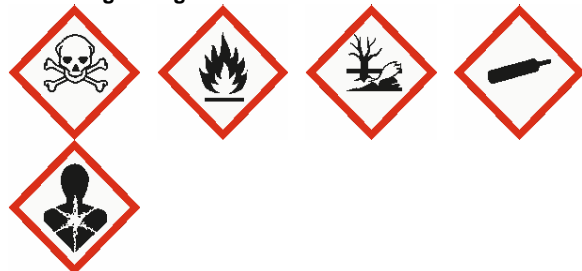
Very toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.

##### Risk advice to man and the environment

Liquefied gas.

#### 2.2. Label elements

##### - Labelling Pictograms



#### - Signal word

Danger

#### - Hazard Statements

H280	Contains gas under pressure; may explode if heated.
H220	Extremely flammable gas.
H330	Fatal if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

#### - Precautionary Statements

##### Precautionary Statement Prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260	Do not breathe gas, vapours.
P273	Avoid release to the environment.

##### Precautionary Statement Response

P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	Eliminate all ignition sources if safe to do so.
P304+P340+P315	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice/attention.
P308 + P313	IF exposed or concerned: Get medical advice/attention.

##### Precautionary Statement Storage

P403	Store in a well-ventilated place.
P405	Store locked up.

##### Precautionary Statement Disposal

None.

#### 2.3. Other hazards

Contact with liquid may cause cold burns/frost bite.

### SECTION 3: Composition/information on ingredients

**Substance / Mixture:** Substance.

#### 3.1. Substances

Arsine

**CAS No:** 7784-42-1

**Index-Nr.:** 033-006-00-7

**EC No (from EINECS):** 232-066-3

**REACH Registration number:**

Not available.

Contains no other components or impurities which will influence the classification of the product.

#### 3.2. Mixtures

Not applicable.

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

**First Aid General Information:**

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Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

#### **First Aid Inhalation:**

Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

#### **First Aid Skin / Eye:**

In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance. Immediately flush eyes thoroughly with water for at least 15 minutes.

#### **First Aid Ingestion:**

Ingestion is not considered a potential route of exposure.

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

Delayed adverse effects possible. Damage to red blood cells (haemolytic poison). Damage to kidneys and liver.

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

Obtain medical assistance.

### **SECTION 5: Fire fighting measures**

#### **5.1. Extinguishing media**

##### **Suitable extinguishing media**

Alcohol-resistant foam. Dry powder. Carbon dioxide. Water fog.

##### **Unsuitable extinguishing media**

Do not use a solid water stream.

#### **5.2. Special hazards arising from the substance or mixture**

##### **Specific hazards**

Exposure to fire may cause containers to rupture/explode.

##### **Hazardous combustion products**

If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Arsenic and its oxides

#### **5.3. Advice for fire-fighters**

##### **Specific methods**

If possible, stop flow of product. Use of water may result in the formation of very toxic aqueous solutions. Specialist clean-up methods may be required. Move container away or cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Prevent water used in emergency cases from entering sewers and drainage systems.

##### **Special protective equipment for fire-fighters**

Gas tight chemically protective clothing (Type 1) in combination with self contained breathing apparatus.

##### **Guideline:**

EN 943-2:2002: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Performance requirements for gas-tight (Type 1) chemical protective suits for emergency teams (ET).

### **SECTION 6: Accidental release measures**

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

Evacuate area. Eliminate ignition sources. Ensure adequate air ventilation. Use self-contained breathing apparatus and chemically protective clothing. Consider the risk of potentially explosive atmospheres. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Monitor concentration of released product. EN 137 Respiratory protective devices — Self-contained open-circuit compressed air

breathing apparatus with full face mask — Requirements, testing, marking.

#### **6.2. Environmental precautions**

Try to stop release.

#### **6.3. Methods and material for containment and cleaning up**

Ventilate area.

#### **6.4. Reference to other sections**

See also sections 8 and 13.

### **SECTION 7: Handling and storage**

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

Only experienced and properly instructed persons should handle gases under pressure. The substance must be handled in accordance with good industrial hygiene and safety procedures. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid exposure, obtain special instructions before use. Take precautionary measures against static discharges. Ensure equipment is adequately earthed. Keep away from ignition sources (including static discharges). Do not smoke while handling product. Assess the risk of potentially explosive atmosphere and the need for explosion-proof equipment. Consider the use of only non-sparking tools. Ensure the complete gas system has been (or is regularly) checked for leaks before use. Installation of a cross purge assembly between the container and the regulator is recommended. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Avoid suckback of water, acid and alkalis. Refer to supplier's handling instructions. Do not allow backfeed into the container. Protect containers from physical damage; do not drag, roll, slide or drop. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the container contents.

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

Secure cylinders to prevent them from falling. Segregate from oxidant gases and other oxidants in store. Keep container below 50°C in a well ventilated place. Cylinders should be stored in the vertical position and properly secured to prevent falling over. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials. All electrical equipment in the storage areas should be compatible with the risk of potentially explosive atmosphere. Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion.

#### **7.3. Specific end use(s)**

None.

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### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

##### Exposure limit value

Value type	value	Note
Great Britain - LTEL	0,05 ppm	EH 40/07

DNEL not available  
PNEC not available.

#### 8.2. Exposure controls

##### Appropriate engineering controls

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep concentrations well below occupational exposure limits. Keep concentrations well below lower explosion limits. Gas detectors should be used when quantities of flammable gases/vapours may be released. Consider work permit system e.g. for maintenance activities. Systems under pressure should be regularly checked for leakages. Provide adequate general or local ventilation. Gas detectors should be used when toxic quantities may be released. Preferably use permanent leak-tight connections (eg. welded pipes). Product to be handled in a closed system and under strictly controlled conditions. The substance must be handled in accordance with good industrial hygiene and safety procedures.

##### Personal protective equipment

##### Eye and face protection

Protect eyes, face and skin from liquid splashes. Wear a face-shield when transfilling and breaking transfer connections. Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Full-face mask recommended

Guideline:

EN 136 Respiratory protective devices. Full face masks. Requirements, testing, marking

##### Skin protection

##### Hand protection

Advice: Chemically resistant gloves complying with EN 374 should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Guideline: EN 374-1/2/3 Protective gloves against chemicals and micro-organisms.

Advice: Wear working gloves and safety shoes while handling containers.

##### Body protection

Protect eyes, face and skin from contact with product. Keep suitable chemically resistant protective clothing readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved.

Guideline:

EN 943: Protective clothing against liquid and gaseous chemicals, including liquid aerosols and solid particles.

##### Other protection

Wear flame resistant/retardant clothing. Take precautionary measures against static discharges. Wear working gloves and safety shoes while handling containers. EN ISO 20345 Personal protective equipment - Safety footwear. ISO/TR 2801:2007 Clothing for protection against heat and flame -- General recommendations for selection, care and use of protective clothing.

##### Respiratory protection

Keep self contained breathing apparatus readily available for emergency use., Use SCBA in the event of high concentrations, The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD., When allowed by a risk assessment a supplied air respirator may be used., Never use any kind of filtering respiratory protection equipment when working with this substance due to it having poor or no warning properties.

Guideline:

EN 136 Respiratory protective devices. Full face masks. Requirements, testing, marking

Guideline:

EN 137 Respiratory protective devices — Self-contained open-circuit compressed air breathing apparatus with full face mask — Requirements, testing, marking.

##### Thermal hazards

If there is a risk of contact with the liquid, all protective equipment should be suitable for extremely low temperatures.

##### Environmental Exposure Controls

Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

### SECTION 9: Physical and chemical properties

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

##### General information

**Appearance/Colour:** Colourless gas.

**Odour:** Garlic like. Poor warning properties at low concentrations.

##### Odour threshold:

Odour threshold is subjective and inadequate to warn for over exposure.

**Melting point:** -117 °C

**Boiling point:** -62,5 °C

**Flash point:** Not applicable for gases and gas mixtures.

##### Evaporation rate:

Not applicable for gases and gas mixtures.

**Flammability range:** 3,9 %(V) - 77,8 %(V)

**Vapour Pressure 20 °C:** 15 bar

**Relative density, gas:** 2,7

**Solubility in water:** 778 mg/l

**Partition coefficient: n-octanol/water:**

Not applicable.

**Autoignition temperature:** 285 °C

**Molecular weight:** 78 g/mol

**Critical temperature:** 99,9 °C

**Relative density, liquid:** 1,6

#### 9.2. Other information

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

Can form potentially explosive atmosphere in air., May react violently with oxidants.

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### 10.4. Conditions to avoid

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

### 10.5. Incompatible materials

For material compatibility see latest version of ISO-11114.

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Arsenic and its oxides

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### Acute oral toxicity

No data available.

#### Acute inhalation toxicity

Value: LC50

Species: Mouse

Exposure time: 1 h

Value in non-standard unit: 20 ppm

Value: LC50

Species: Rat

Exposure time: 4 h

Value in non-standard unit: 10 ppm

#### Acute dermal toxicity

No data available.

#### Skin irritation

No data available.

#### Eye irritation

No data available.

#### Sensitization

No data available.

#### Assessment mutagenicity

No data available.

#### Assessment carcinogenicity

No data available.

#### Assessment toxicity to reproduction

No data available.

#### Specific Target Organ Toxicity (STOT) - Single Exposure

Organ: Liver

Organ: Kidneys

Organ: Heart

#### Specific Target Organ Toxicity (STOT) - Repeated Exposure

Organ: Heart

Organ: Liver

Organ: Kidneys

Damage to red blood cells (haemolytic poison), Damage to central nervous system.

## SECTION 12: Ecological information

### 12.1. Toxicity

Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

#### Acute and prolonged toxicity fish

No data available.

#### Acute toxicity aquatic invertebrates

No data available.

#### Toxicity aquatic plants

No data available.

#### Toxicity microorganisms

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.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Contact supplier if guidance is required. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Dispose of container via gas supplier only. Must not be discharged to atmosphere. Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods.

Gases in pressure containers (including halons) containing dangerous substances

EWC Nr. 16 05 04\*

## SECTION 14: Transport information

### ADR/RID

#### 14.1. UN number

2188

#### 14.2. UN proper shipping name

Arsine

#### 14.3. Transport hazard class(es)

Class: 2

Classification Code: 2TF

Labels: 2.3, 2.1

Hazard number: 263

Tunnel restriction code: (D)

Emergency Action Code: 2PE

#### 14.4. Packing group (Packing Instruction)

P200

#### 14.5. Environmental hazards

Environmentally hazardous.

#### 14.6. Special precautions for user

None.

## IMDG

#### 14.1. UN number

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2188

#### 14.2. UN proper shipping name

Arsine

#### 14.3. Transport hazard class(es)

Class: 2.3  
Labels: 2.3, 2.1  
EmS: FD,SU,

#### 14.4. Packing group (Packing Instruction)

P200

#### 14.5. Environmental hazards

Environmentally hazardous.

#### 14.6. Special precautions for user

None.

#### 14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

#### IATA

#### 14.5. Environmental hazards

Environmentally hazardous.

#### 14.6. Special precautions for user

None.

#### Other transport information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Ensure that the valve outlet cap nut or plug (where provided) is correctly fitted. Ensure that the valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

#### SECTION 15: Regulatory information

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

Seveso Directive 96/82/EC: Listed

##### Other regulations

Dangerous Substances and Explosive Atmospheres Regulations (DSEAR 2002 No. 2776)  
Management of Health and Safety at Work Regulations (1999 No. 3242)  
The Regulatory Reform (Fire Safety) Order 2005 (2005 No. 1541)  
Control of Substances Hazardous to Health Regulations (COSHH, 2002 No. 2677)  
Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations (EPS, 1996 No. 192)  
Provision and Use of Work Equipment Regulations (PUWER, 1998 No. 2306)  
Personal Protective Equipment Regulations (1992 No. 2966)  
Control of Major Accident Hazards Regulations (COMAH, 1999 No. 743)  
Chemical Hazards Information and Packaging for Supply (CHIP, 1994 No. 3247)  
Pressure Systems Safety Regulations (PER, 2000 No. 128)

#### 15.2. Chemical safety assessment

CSA has not been carried out.

#### SECTION 16: Other information

Ensure all national/local regulations are observed. Ensure operators understand the flammability hazard. Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

##### Advice

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.

##### Further information

##### Note:

When using this document care should be taken, as the decimal sign and its position complies with rules for the structure and drafting of international standards, and is a comma on the line. As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

##### References

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to: European Chemical Agency: Guidance on the Compilation of Safety Data Sheets. European Chemical Agency: Information on Registered Substances <http://apps.echa.europa.eu/registered/registered-sub.aspx#search> European Industrial Gases Association (EIGA) Doc. 169/11 Classification and Labelling guide. ISO 10156:2010 Gases and gas mixtures -- Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets. International Programme on Chemical Safety (<http://www.inchem.org/>) Matheson Gas Data Book, 7th Edition. National Institute for Standards and Technology (NIST) Standard Reference Database Number 69 The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (<http://ecb.jrc.ec.europa.eu/esis/>). The European Chemical Industry Council (CEFIC) ERICards. United States of America's National Library of Medicine's toxicology data network TOXNET (<http://toxnet.nlm.nih.gov/index.html>) Substance specific information from suppliers. EH40 (as amended) Workplace exposure limits.

#### End of document