

# Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/12/2010

Reviewed on 05/11/2010

## 1 Identification of substance:

### Product details:

**Product name:** Pentacarbonyliron

**Stock number:** 31113

### Manufacturer/Supplier:

Alfa Aesar, A Johnson Matthey Company  
Johnson Matthey Catalog Company, Inc.  
30 Bond Street  
Ward Hill, MA 01835-8099  
Emergency Phone: (978) 521-6300  
CHEMTREC: (800) 424-9300  
Web Site: www.alfa.com

**Information Department:** Health, Safety and Environmental Department

### Emergency information:

During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

## 2 Composition/Data on components:

### Chemical characterization:

**Description:** (CAS#)

Pentacarbonyliron (CAS# 13463-40-6)

**Identification number(s):**

**EINECS Number:** 236-670-8

## 3 Hazards identification

### Hazard description:



T+ Very toxic  
F Highly flammable

### Information pertaining to particular dangers for man and environment

R 11 Highly flammable.

R 24 Toxic in contact with skin.

R 26/28 Very toxic by inhalation and if swallowed.

### Classification system

**HMIS ratings (scale 0-4)**

(Hazardous Materials Identification System)

HEALTH	4
FIRE	3
REACTIVITY	1

Health (acute effects) = 4  
Flammability = 3  
Reactivity = 1

### GHS label elements



**Danger**

2.6/2 - Highly flammable liquid and vapour.



**Danger**

3.1/2 - Fatal if swallowed.

3.1/2 - Fatal in contact with skin.

3.1/1 - Fatal if inhaled.

### Prevention:

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

Wear protective gloves/clothing.

### Response:

IF ON SKIN: Wash with plenty of soap and water.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Immediately call a POISON CENTER or doctor/physician.

## 4 First aid measures

### General information

Immediately remove any clothing soiled by the product.

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Remove breathing apparatus only after contaminated clothing has been completely removed.  
In case of irregular breathing or respiratory arrest provide artificial respiration.

**After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm.  
Seek immediate medical advice.

**After skin contact**

Immediately wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.

**After eye contact**

Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing**

Do not induce vomiting; immediately call for medical help.  
Seek immediate medical advice.

### 5 Fire fighting measures

**Suitable extinguishing agents** CO<sub>2</sub>, sand, extinguishing powder. Do not use water.

**For safety reasons unsuitable extinguishing agents** Water

**Special hazards caused by the material, its products of combustion or resulting gases:**

In case of fire, the following can be released:

Carbon monoxide and carbon dioxide

Metal oxide fume

**Protective equipment:**

Wear self-contained respirator.

Wear fully protective impervious suit.

### 6 Accidental release measures

**Person-related safety precautions:**

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Keep away from ignition sources

**Measures for environmental protection:**

Do not allow material to be released to the environment without proper governmental permits.

**Measures for cleaning/collecting:**

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

Keep away from ignition sources.

**Additional information:**

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

### 7 Handling and storage

**Handling****Information for safe handling:**

Handle under dry protective gas.

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

Open and handle container with care.

**Information about protection against explosions and fires:**

Keep ignition sources away.

Protect against electrostatic charges.

Fumes can combine with air to form an explosive mixture.

**Storage**

**Requirements to be met by storerooms and receptacles:** Store in a cool location.

**Information about storage in one common storage facility:**

Store away from oxidizing agents.

Store away from air.

**Further information about storage conditions:**

Store under dry inert gas.

Avoid contact with air/oxygen.

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

This product is air sensitive.

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## 8 Exposure controls and personal protection

### Additional information about design of technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

### Components with limit values that require monitoring at the workplace:

Iron pentacarbonyl

	ppm
ACGIH TLV	0.1, 0.2-STEL
Belgium TWA	0.1, 0.2-STEL
Denmark TWA	0.1
Finland TWA	0.01
France TWA	0.1
Germany TWA	0.1
Ireland TWA	0.01
Netherlands TWA	0.01
Russia TWA	0.1mg/m <sup>3</sup>
Switzerland TWA	0.1, 0.2-STEL
United Kingdom TWA	0.01

**Additional information:** No data

### Personal protective equipment

#### General protective and hygienic measures

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Do not inhale gases / fumes / aerosols.

Avoid contact with the eyes and skin.

**Breathing equipment:** Use suitable respirator when high concentrations are present.

**Protection of hands:** Impervious gloves

**Eye protection:** Safety glasses

**Body protection:** Protective work clothing.

## 9 Physical and chemical properties:

### General Information

<b>Form:</b>	Liquid
<b>Color:</b>	Red
<b>Odor:</b>	Pungent

### Change in condition

<b>Melting point/Melting range:</b>	-20°C (-4°F)
<b>Boiling point/Boiling range:</b>	103°C (217°F)
<b>Sublimation temperature / start:</b>	Not determined

**Flash point:** -15°C (5°F)

**Ignition temperature:** 60°C (140°F)

**Decomposition temperature:** Not determined

### Explosion limits:

<b>Lower:</b>	3.7 Vol %
<b>Upper:</b>	12.5 Vol %

**Vapor pressure at 20°C (68°F):** 32 hPa (24 mm Hg)

**Density at 20°C (68°F):** 1.457 g/cm<sup>3</sup>

**Solubility in / Miscibility with Water:** Not miscible or difficult to mix

## 10 Stability and reactivity

### Thermal decomposition / conditions to be avoided:

Decomposition will not occur if used and stored according to specifications.

### Materials to be avoided:

Oxidizing agents

Bases

Halogens

Amines

Air

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Oxygen  
Heat  
**Dangerous reactions** No dangerous reactions known  
**Dangerous products of decomposition:**  
Carbon monoxide  
Carbon monoxide and carbon dioxide  
Metal oxide fume

## 11 Toxicological information

### Acute toxicity:

#### LD/LC50 values that are relevant for classification:

Oral	LD50	62 mg/kg (mouse) (RTECS NO4900000)
		25 mg/kg (rat) (RTECS NO4900000)
Dermal	LD50	56 mg/kg (rabbit) (RTECS NO4900000)
Inhalative	LC50/4H	81.6 mg/m <sup>3</sup> /4H (rat) (RTECS; calcd)
		10 ppm/4H (rat) (RTECS NO4900000)

### Primary irritant effect:

**on the skin:** Irritant to skin and mucous membranes.

**on the eye:** Irritating effect.

**Sensitization:** No sensitizing effects known.

### Subacute to chronic toxicity:

Pentacarbonyl iron may cause cyanosis and circulatory collapse. Inhalation may cause headache, nausea, dizziness, vomiting, and unconsciousness. Coughing, chest pain and difficulty breathing and pneumonitis may be present. Injury to the kidneys, liver and brain is possible. Death may result due to the inability of blood hemoglobin to carry oxygen to the brain.

### Additional toxicological information:

Danger through skin absorption.

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

## 12 Ecological information:

### Additional ecological information:

#### General notes:

Do not allow product to reach ground water, water course or sewage system.

Danger to drinking water if even small quantities leak into the ground.

Do not allow material to be released to the environment without proper governmental permits.

## 13 Disposal considerations

### Product:

**Recommendation** Consult state, local or national regulations to ensure proper disposal.

### Uncleaned packagings:

**Recommendation:** Disposal must be made according to official regulations.

## 14 Transport information

### DOT regulations:



**Hazard class:**

6.1

**Identification number:**

UN1994

**Packing group:**

I

**Poison inhalation hazard:**

Yes

**Proper shipping name (technical name):** IRON PENTACARBONYL

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Label 6.1+3

Land transport ADR/RID (cross-border)



ADR/RID class: 6.1 (TF1) Toxic substances  
 Danger code (Kemler): 663  
 UN-Number: 1994  
 Packaging group: I  
 Description of goods: 1994 IRON PENTACARBONYL

Maritime transport IMDG:



IMDG Class: 6.1  
 UN Number: 1994  
 Label: 6.1+3  
 Packaging group: I  
 EMS Number: F-E, S-D  
 Marine pollutant: No  
 Proper shipping name: IRON PENTACARBONYL

Air transport ICAO-TI and IATA-DGR:



ICAO/IATA Class: 6.1  
 UN/ID Number: 1994  
 Label: 6.1+3  
 Packaging group: I  
 Proper shipping name: IRON PENTACARBONYL

UN "Model Regulation": UN1994, IRON PENTACARBONYL, 6.1 (3), I

## 15 Regulations

Product related hazard informations:

Hazard symbols:

T+ Very toxic  
 F Highly flammable

Risk phrases:

11 Highly flammable.  
 24 Toxic in contact with skin.  
 26/28 Very toxic by inhalation and if swallowed.

Safety phrases:

16 Keep away from sources of ignition - No smoking.  
 28 After contact with skin, wash immediately with plenty of soap and water  
 36/37 Wear suitable protective clothing and gloves.  
 45 In case of accident or if you feel unwell, seek medical advice immediately.

National regulations

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

Information about limitation of use:

For use only by technically qualified individuals.  
 This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

## 16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety

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Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing MSDS:** Health, Safety and Environmental Department.

**Contact:** Zachariah Holt

**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)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

HMSIS: Hazardous Materials Identification System (USA)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

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