



IRON CARBONYL, tech-95

Safety Data Sheet INFE030

Date of issue: 12/09/2016

Version: 1.0

SECTION 1: Identification

1.1. Product identifier

Product name	: IRON CARBONYL, tech-95
Product code	: INFE030
Product form	: Substance
Physical state	: Liquid
Formula	: C5FeO5
Synonyms	: PENTACARBONYL IRON
Chemical family	: METAL CARBONYL

1.2. Recommended use of the chemical and restrictions on use

Recommended use	: Chemical intermediate For research and industrial use only
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1.3. Details of the supplier of the safety data sheet

GELEST, INC.

11 East Steel Road
Morrisville, PA 19067
USA

T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST

info@gelest.com - www.gelest.com

1.4. Emergency telephone number

Emergency number	: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)
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SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Flammable liquids Category 2	H225
Acute toxicity (oral) Category 2	H300
Acute toxicity (dermal) Category 2	H310
Acute toxicity (inhalation:vapor) Category 1	H330
Specific target organ toxicity (repeated exposure) Category 1	H372
Full text of H statements : see section 16	

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02

GHS06

GHS08

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H225 - Highly flammable liquid and vapor
H300+H310+H330 - Fatal if swallowed, in contact with skin or if inhaled
H372 - Causes damage to organs through prolonged or repeated exposure

Precautionary statements (GHS-US) :

P280 - Wear protective gloves/protective clothing/eye protection/face protection
P310 - Immediately call a POISON CENTER
P210 - Keep away from heat, sparks, open flames. - No smoking
P240 - Ground/Bond container and receiving equipment
P241 - Use explosion-proof electrical equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P260 - Do not breathe vapors
P262 - Do not get in eyes, on skin, or on clothing
P264 - Wash hands thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P284 - In case of inadequate ventilation wear respiratory protection
P330 - Rinse mouth
P301+P310 - If swallowed: Immediately call a POISON CENTER
P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse

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skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P314 - Get medical advice/attention if you feel unwell
P320 - Specific treatment is urgent (see first aid instructions on this label)
P361 - Take off immediately all contaminated clothing
P363 - Wash contaminated clothing before reuse
P370+P378 - In case of fire: Use water spray or fog, foam, carbon dioxide, dry chemical to extinguish
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P403+P235 - Keep in a cool place
P405 - Store locked up
P501 - Dispose of contents/container to licensed waste disposal facility

2.3. Hazards not otherwise classified (HNOC)

No additional information available

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Substance type : Mono-constituent
Name : IRON CARBONYL, tech-95
CAS No : 13463-40-6

Name	Product identifier	%	GHS-US classification
Iron carbonyl	(CAS No) 13463-40-6	95 - 100	Flam. Liq. 2, H225 Acute Tox. 2 (Oral), H300 Acute Tox. 2 (Dermal), H310 Acute Tox. 1 (Inhalation:vapour), H330 STOT RE 1, H372

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

4.1. Description of first aid measures

First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.
First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician.
First-aid measures after skin contact : Remove/take off immediately all contaminated clothing. Wash with plenty of soap and water. Immediately call a poison center or doctor/physician.
First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.
First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Immediately call a poison center or doctor/physician.

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

Symptoms/injuries : Causes damage to organs (lungs) through prolonged or repeated exposure.
Symptoms/injuries after inhalation : Fatal if inhaled. Danger of serious damage to health by prolonged exposure through inhalation. Low levels may cause headache, nausea, dizziness, vomiting and unconsciousness. Prolonged or high levels of exposure may cause cyanosis and circulatory collapse.
Symptoms/injuries after skin contact : Fatal in contact with skin. May cause skin irritation. Repeated exposure to this material can result in absorption through skin causing significant health hazard.
Symptoms/injuries after eye contact : May cause eye irritation.
Symptoms/injuries after ingestion : Fatal if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

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

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Water fog. Foam. Carbon dioxide. Dry chemical.
Unsuitable extinguishing media : Do not use straight streams.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Highly flammable liquid and vapor. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.

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Explosion hazard : May form flammable/explosive vapor-air mixture.

5.3. Advice for firefighters

Firefighting instructions : Exercise caution when fighting any chemical fire. Use water spray or fog for cooling exposed containers.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment as described in Section 8.

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Use only non-sparking tools.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Handle empty containers with care because residual vapors are flammable. Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Precautions for safe handling : Avoid all eye and skin contact and do not breathe vapor and mist. Ground/bond container and receiving equipment. Take precautionary measures against static discharge. Use only outdoors or in a well-ventilated area. Use only non-sparking tools.

Hygiene measures : Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.

Storage conditions : Keep container tightly closed. Keep in a cool place. Store locked up.

Incompatible materials : Alkalis. Amines. Oxidizing agent.

Storage area : Store in a well-ventilated place. Store away from heat.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Iron carbonyl (13463-40-6)		
ACGIH	ACGIH TWA (ppm)	0.1 ppm
ACGIH	ACGIH STEL (ppm)	0.2 ppm
NIOSH	NIOSH REL (TWA) (mg/m ³)	0.23 mg/m ³
NIOSH	NIOSH REL (TWA) (ppm)	0.1 ppm
NIOSH	NIOSH REL (STEL) (mg/m ³)	0.45 mg/m ³
NIOSH	NIOSH REL (STEL) (ppm)	0.2 ppm

8.2. Exposure controls

Appropriate engineering controls : Provide local exhaust or general room ventilation.

Personal protective equipment : Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

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Hand protection	: Neoprene or nitrile rubber gloves.
Eye protection	: Chemical goggles or face shield. Contact lenses should not be worn.
Skin and body protection	: Wear suitable protective clothing. Long-sleeved fire-resistant lab uniform or coverall is recommended.
Respiratory protection	: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified organic vapor (black cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid.
Molecular mass	: 195.9 g/mol
Color	: dark red.
Odor	: No data available
Odor threshold	: No data available
Refractive index	: 1.5196
pH	: No data available
Relative evaporation rate (butyl acetate=1)	: > 1
Melting point	: -20 °C
Freezing point	: No data available
Boiling point	: 103 °C
Flash point	: -15 °C
Critical temperature	: 285 - 288 °C
Auto-ignition temperature	: 55 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: Highly flammable liquid and vapor
Vapor pressure	: 30.3 mm Hg @ 40 mm Hg
Critical pressure	: 29.6 atm
Relative vapor density at 20 °C	: 1.1 (methanol)
Relative density	: 0.95
Solubility	: Insoluble in water. Organic solvent: Soluble: ether, ethyl acetate, toluene
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosion limits	: 3.7 - 12.5 vol % (lower; upper)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable when stored in the dark in sealed containers.

10.3. Possibility of hazardous reactions

Decomposes at temperatures exceeding 100°C. Material decomposes slowly in contact with moist air or with water liberating carbon monoxide.

10.4. Conditions to avoid

Heat. Sparks. Open flame.

10.5. Incompatible materials

Alkalis. Amines. Oxidizing agent.

10.6. Hazardous decomposition products

Carbon monoxide. Iron. Iron oxide. Organic acid vapors.

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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Fatal if swallowed. Dermal: Fatal in contact with skin. Inhalation:vapour: Fatal if inhaled.

IRON CARBONYL, tech-95 (13463-40-6)	
ATE US (oral)	31.000 mg/kg body weight
ATE US (dermal)	56.000 mg/kg body weight
ATE US (vapors)	0.320 mg/l/4h

Iron carbonyl (13463-40-6)	
LD50 oral rat	31 mg/kg
LD50 oral mouse	62 mg/kg
LD50 oral rabbit	12 mg/kg
LD50 oral guinea pig	22 mg/kg
LD50 dermal rabbit	56 mg/kg RTECS Number: NO4900000
LC50 inhalation rat (mg/l)	0.32 mg/l/4h
LC50 inhalation rat (ppm)	10 ppm/4h
LC50 inhalation rat	43.5 mg/m ³
ATE US (oral)	31.000 mg/kg body weight
ATE US (dermal)	56.000 mg/kg body weight
ATE US (gases)	10.000 ppmV/4h
ATE US (vapors)	0.320 mg/l/4h
ATE US (dust, mist)	0.320 mg/l/4h

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen
Reproductive toxicity	: Not classified
Specific target organ toxicity – single exposure	: Not classified
Specific target organ toxicity – repeated exposure	: Causes damage to organs through prolonged or repeated exposure.
Aspiration hazard	: Not classified
Potential Adverse human health effects and symptoms	: While toxicity data is available, it is reasonable to assume that the iron carbonyl will generate carbon monoxide which complexes with hemoglobin.
Symptoms/injuries after inhalation	: Fatal if inhaled. Danger of serious damage to health by prolonged exposure through inhalation. Low levels may cause headache, nausea, dizziness, vomiting and unconsciousness. Prolonged or high levels of exposure may cause cyanosis and circulatory collapse.
Symptoms/injuries after skin contact	: Fatal in contact with skin. May cause skin irritation. Repeated exposure to this material can result in absorption through skin causing significant health hazard.
Symptoms/injuries after eye contact	: May cause eye irritation.
Symptoms/injuries after ingestion	: Fatal if swallowed. Swallowing a small quantity of this material will result in serious health hazard.
Reason for classification	: Expert judgment

SECTION 12: Ecological information

12.1. Toxicity

Iron carbonyl (13463-40-6)	
EC50 Daphnia 1	130 mg/l (Exposure time: 48 h - Species: Daphnia magna)

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

Iron carbonyl (13463-40-6)	
Log Pow	3 (at 25 °C)

12.4. Mobility in soil

No additional information available

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12.5. Other adverse effects

Other adverse effects	: This substance may be hazardous to the environment.
Effect on ozone layer	: No additional information available
Effect on the global warming	: No known effects from this product.
GWPMix comment	: No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Sewage disposal recommendations	: Do not dispose of waste into sewer.
Waste disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations. In a well ventilated area, treat a dilute basic (pH 10-11) slurry of the material with 50% excess of sodium hypochlorite (laundry bleach). Control temperature by rate of addition. Absorb slurry onto clay or other inert material and landfill in accordance with regulations. Dispose of contents/container to licensed waste disposal facility.
Additional information	: Handle empty containers with care because residual vapors are flammable.
Ecology - waste materials	: Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number

UN-No.(DOT)	: 1994
DOT NA no.	UN1994

14.2. UN proper shipping name

Transport document description	: UN1994 Iron pentacarbonyl (Inhalation Hazard Zone A), 6.1 (3), I
Proper Shipping Name (DOT)	: Iron pentacarbonyl Inhalation Hazard Zone A
Class (DOT)	: 6.1 - Class 6.1 - Poisonous materials 49 CFR 173.132
Packing group (DOT)	: I - Great Danger
Hazard labels (DOT)	: 6.1 - Poison 3 - Flammable liquid



DOT Packaging Non Bulk (49 CFR 173.xxx)	: 226
DOT Packaging Bulk (49 CFR 173.xxx)	: 244
DOT Packaging Exceptions (49 CFR 173.xxx)	: None

14.3. Additional information

Emergency Response Guide (ERG) Number	: 131
Other information	: No supplementary information available.

Transport by sea

DOT Vessel Stowage Location	: D - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters"

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: Forbidden

SECTION 15: Regulatory information

15.1. US Federal regulations

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Iron carbonyl (13463-40-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on the United States SARA Section 302
Subject to reporting requirements of United States SARA Section 313

SARA Section 302 Threshold Planning Quantity (TPQ)	100
SARA Section 313 - Emission Reporting	1.0 %

15.2. International regulations

CANADA

Iron carbonyl (13463-40-6)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification	Class B Division 2 - Flammable Liquid Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects
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EU-Regulations

Iron carbonyl (13463-40-6)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Iron carbonyl (13463-40-6)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations

Iron carbonyl (13463-40-6)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Full text of H-phrases::

H225	Highly flammable liquid and vapor
H300	Fatal if swallowed
H310	Fatal in contact with skin
H330	Fatal if inhaled
H372	Causes damage to organs through prolonged or repeated exposure

Abbreviations and acronyms

: Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling.

HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 3 Serious Hazard - Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 F and boiling points above 100 F. as well as liquids with flash points between 73 F and 100 F. (Classes IB & IC)

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

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Prepared by safety and environmental affairs.

Date of issue: 12/09/2016 Version: 1.0

SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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