



Safety Data Sheet

Section 1 - Identification.....2

Section 2: Hazard Identification.....2

Section 3: Composition/information on ingredients..... 5

Section 4: First aid measures..... 5

Section 5: Firefighting measurers..... 6

Section 6: Accidental release measurers..... 7

Section 7: Handling and storage..... 8

Section 8: Exposure controls – Personal protection.....9

Section 9: Physical and chemical properties..... 11

Section 10: Stability and reactivity..... 13

Section 11: Toxicological information.....14

Section 12: Ecological information..... 17

Section 13: Disposal considerations..... 20

Section 14: Transportation information..... 21

Section 15: Regulatory information..... 23

Section 16: Other information.....24

Section 1 - Identification

1.1 Product Identifier

Product Name : Formic Acid

CAS No. : 64-18-6

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

Identified uses : Reagent for analysis

1.3 Details of the supplier of the safety data sheet

Company : 9920 Pacific Heights Blvd
Suit 150
San Diego
California -92121

1.4 Emergency Telephone number

Emergency phone : +1 (858) 245-0283

Section 2: Hazard Identification

2.1 Classification of the substance or the mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids	Category 3	H226:Flammable liquid and vapour.
Corrosive to metals	Category 1	H290:May be corrosive to metals.
Acute toxicity	Category 4	H302:Harmful if swallowed.
Acute toxicity	Category 3	H331:Toxic if inhaled.
Skin corrosion	Category 1A	H314:Causes severe skin burns and eye damage.
Serious eye	Category 1	H318:Causes serious eye damage.

2.2 Label elements

Label according Regulation (EC) 1272/2008

Hazard Pictogram



Signal Word:
DANGER

Hazard statements

H226	Flammable liquid and vapour.
H290	May be corrosive to metals.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H331	Toxic if inhaled.

Supplemental Hazard Statements

EUH071	Corrosive to the respiratory tract.
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Precautionary Statements

Prevention:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301+P312	IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

P304+P340+P310

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.

P305+P351+P338

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Reduced Labelling (<= 125 ml)

Hazard Pictogram



Signal Word:
DANGER

Hazard statements

H331

Toxic if inhaled.

H314

Causes severe skin burns and eye damage.

Precautionary Statements

P280

Wear protective gloves/ protective clothing/ eye protection/ face protection.

P303+P361+P353

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

P304+P340+P310

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.

P305+P351+P338

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard information (EU)

EUH071

Corrosive to the respiratory tract.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information:

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information:

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Section 3: Composition/information on ingredients

3.1 Substance

EC-No. : 200-579-1
Index-No. : 607-001-00-0

Section 4: First aid measures

4.1 Description of first aid measures

General advice

First aiders need to protect themselves. Show this safety data sheet to the doctor in Attendance.

If inhaled

After inhalation: fresh air. Immediately call in physician.
If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.

In case of eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.
Remove contact lenses.

If swallowed

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Pulmonary failure possible after aspiration of vomit. Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indications of any immediate medical attention and special treatment needed

No data available

Section 5: Firefighting measures

5.1 Extinguishing Media

Suitable extinguishing media	: Water Foam Carbon dioxide (CO ₂) Dry powder
Unsuitable extinguishing media	: For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazard arising from the substance or mixture

Specific hazards during fire fighting	: Combustible. Vapours are heavier than air and may spread along floors. Forms explosive mixtures with air at elevated temperatures. Development of hazardous combustion gases or
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Hazardous combustion products : vapours possible in the event of fire.
: Carbon oxides

5.3 Advice for firefighters

Special protective equipment for fire-fighters : Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information : Remove container from danger zone and cool with water.
Prevent fire extinguishing water from contaminating surface water or the ground water system.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions:

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environment precautions

Environmental precautions : Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10).
Take up carefully with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal considerations see section 13.

Section 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Temperature class

T1

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers

No metal containers. May decompose forming gaseous products, especially when stored over long periods. Close containers in such a way to enable internal pressure to escape (e.g. excess pressure valve).

No metal containers.

Further information on storage conditions

Protected from light. Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorised persons.

Storage class (TRGS 510)

3, Flammable liquids

Further information on storage stability

Recommended storage temperature see product label.

Recommended storage temperature

Recommended storage temperature see product label.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

Section 8: Exposure controls – Personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value
Formic acid	Worker DNEL, longterm	Inhalation	Systemic effects	9,5 mg/m ³
	Worker DNEL, longterm	Inhalation	Local effects	9,5 mg/m ³
	Consumer DNEL, longterm	Inhalation	Systemic effects	3 mg/m ³

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
Formic acid	Fresh water	2 mg/l
	Fresh water sediment	13,4 mg/kg
	Marine water	0,2 mg/l
	Marine sediment	1,34 mg/kg
	Sewage treatment plant	7,2 mg/l
	Soil	1,5 mg/kg

8.2 Exposure Controls

Personal protective equipment

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection	: Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles
Hand protection	
Material	: Chloroprene
Break through time	: 480 min
Glove thickness	: 0,65 mm
Protective index	: Full contact
Manufacturer	: KCL 720 Camapren®
Material	: Latex gloves
Break through time	: 60 min
Glove thickness	: 0,6 mm
Protective index	: Splash contact
Manufacturer	: Lapren® (KCL 706 / Aldrich Z677558, Size M)
Remarks	: This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Skin and body protection	: Flame retardant antistatic protective clothing.
Respiratory protection	: required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.
Recommended Filter type:	: Filter E-(P3)
The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer.	
These measures have to be properly documented.	

Environmental exposure controls

Advice

Do not let product enter drains. Risk of explosion.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	: liquid
Color	: Colourless
Odor	: stinging
Odour Threshold	: 0,02 ppm
Melting point/range	: 8,5 °C
Boiling point/boiling range	: 100,80 °C (1.013 hPa)
Flammability	: Not data available
Upper explosion limit / Upper flammability limit	: Upper explosion limit 38 %(V)
Lower explosion limit / Lower flammability limit	: 18 %(V)
Flash point	: -47 °C
Autoignition temperature	: 540 °C
Decomposition temperature	: 350 °C Method: OECD Test Guideline 113
pH	: 2,2 (20 °C) Concentration: 10 g/l
Viscosity, dynamic	: 1,8 mPa.s (20 °C) Method: OECD Test Guideline 114 GLP: yes

	1,22 mPa.s (40 °C) Method: OECD Test Guideline 114 GLP: yes
Viscosity, kinematic	: 1,47 mm ² /s (20 °C) Method: OECD Test Guideline 114 GLP: yes
	1,02 mm ² /s (40 °C) Method: OECD Test Guideline 114 GLP: yes
Flow time	: No data available
Solubility(ies) Water solubility	: (20 °C) GLP: yes miscible in all proportions, (experimental)
Partition coefficient: n- octanol/water	: log Pow: -2,1 (23 °C) pH: 7 Method: OECD Test Guideline 107 GLP: yes Bioaccumulation is not expected.
Vapor pressure	: 171 hPa (50 °C) Method: OECD Test Guideline 104 GLP: yes
Relative density	: 1,22 (20 °C) Method: OECD Test Guideline 109 GLP: yes
Density	: 1,22 g/cm ³ (20 °C) Method: OECD Test Guideline 109 GLP: yes
Relative vapour density	: 1,59 (Air = 1.0)

9.2 Other information

Explosives	: Not classified as explosive.
Oxidizing properties	: none
Burning rate	: No data available
Self-ignition	: 528 °C 1.008 hPa Method: Tested according to Directive 92/69/EEC. GLP: yes
Metal corrosion rate	: May be corrosive to metals.
Evaporation rate	: No data available
Surface tension	: 71,5 mN/m, 1 g/l, 20 °C, OECD Test Guideline 115, GLP: yes
Molecular weight	: 46,03 g/mol

Section 10: Stability and reactivity

10.1 Reactivity

Vapors may form explosive mixture with air.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions

Hazardous reactions

Risk of ignition or formation of inflammable gases or vapours with:

Aluminium

Risk of explosion with:

organic nitro compounds

sodium hypochlorite

hydrogen peroxide

furfuryl alcohol

Generates dangerous gases or fumes in contact with:

alkalines

Strong oxidizing agents

sulfuric acid

nonmetallic oxides

metal catalysts

Oxides of phosphorus

Nitric acid

nitrates

Exothermic reaction with:

alkaline earth hydroxides

alkali hydroxides

bases

Amines

10.4 Conditions to avoid

Conditions to avoid

Heating.

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

In the event of fire: see section 5

Section 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute toxicity estimate Oral - 737,37 mg/kg

(Calculation method)

LD50 Oral - Rat - male and female - 730 mg/kg (Formic acid)

(OECD Test Guideline 401)

Remarks: (ECHA)

Acute toxicity estimate Oral - 500 mg/kg (Formic acid)

(ATE value derived from LD50/LC50 value)

Acute toxicity estimate Inhalation - 4 h - 7,93 mg/l - vapour (Calculation method)

LC50 Inhalation - Rat - male and female - 4 h - 7,85 mg/l - vapour

(Formic acid)

(OECD Test Guideline 403)

Acute toxicity estimate Inhalation - 7,4 mg/l - vapour

(Formic acid)

(ATE value derived from LD50/LC50 value)

Dermal: No data available

Skin corrosion/irritation

Skin - Rabbit (Formic acid)

Result: Causes severe burns.

(OECD Test Guideline 404)

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Serious eye damage/eye irritation

Remarks: Causes serious eye damage.

conjunctivitis

Lacrimal irritation due to vapours.

Respiratory or skin sensitization

Buehler Test - Guinea pig (Formic acid)

Result: negative

(OECD Test Guideline 406)

Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals. (Formic acid)

Germ cell mutagenicity

Test Type: Ames test

(Formic acid)

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Test Type: sister chromatid exchange assay

(Formic acid)

Test system: Chinese hamster lung cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 479

Result: negative

Test Type: sister chromatid exchange assay

(Formic acid)

Test system: Human lymphocytes

Metabolic activation: without metabolic activation

Method: OECD Test Guideline 479

Result: negative

Test Type: In vitro mammalian cell gene mutation test

(Formic acid)

Test system: Chinese hamster ovary cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative

Test Type: Chromosome aberration test in vitro

(Formic acid)

Test system: Chinese hamster ovary cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 473

Result: negative

(Formic acid)

Test Type: gene mutation test

Species: Drosophila melanogaster

Application Route: Oral

Method: OECD Test Guideline 477

Result: negative

Carcinogenicity

No data available

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

Corrosive to the respiratory tract. (Formic acid)

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Repeated dose toxicity - Rat - male and female - Oral - 52 Weeks - No observed adverse effect level - 400 mg/kg - Lowest observed adverse effect level - 2.000 mg/kg

Remarks: (in analogy to similar products)

(Formic acid)

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting (Formic acid)

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. (Formic acid)

Kidney - Irregularities - Based on Human Evidence

(Formic acid)

Section 12: Ecological information

12.1 Toxicity

Components:

Formic acid:

Toxicity to fish	: LC50 (Danio rerio (zebra fish)): 130 mg/l End point: mortality Exposure time: 96 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 203 GLP: yes Remarks: The value is given in analogy to the following substances: The value is given in analogy to the following substances: ammonium formate
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 365 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 202 GLP: yes Remarks: The value is given in analogy to the following substances: The value is given in analogy to the following substances: ammonium formate
Toxicity to algae/aquatic plants	: ErC50 (Pseudokirchneriella subcapitata): 1.240 mg/l Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: yes Remarks: The value is given in analogy to the following substances: The value is given in analogy to the following substances: ammonium formate
Toxicity to microorganisms	: NOEC (activated sludge): 72 mg/l

	Exposure time: 13 d
	Test Type: static test
	Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC: ≥ 100 mg/l
	End point: reproduction rate
	Exposure time: 21 d
	Species: Daphnia magna (Water flea)
	Test Type: semi-static test
	Analytical monitoring: yes
	Method: OECD Test Guideline 211
	GLP: yes

12.2 Persistence and degradability

Components:

Formic acid:

Biodegradability	: Test Type: aerobic
	Inoculum: activated sludge
	Concentration: 100 mg/l
	Result: Readily biodegradable.
	Biodegradation: 100 %
	Exposure time: 14 d
	Method: OECD Test Guideline 301C
Biochemical Oxygen Demand (BOD)	: 86 mg/g
	Incubation time: 5 d
	Remarks: (External MSDS)
BOD/ThOD	: 8.60 %

12.3 Bioaccumulated potential

Components:

Formic acid:

Bioaccumulation	: Remarks: Bioaccumulation is unlikely.
	Remarks: Does not significantly accumulate in organisms.

Partition coefficient: n-octanol/water : log Pow: -2,1 (23 °C)
pH: 7
Method: OECD Test Guideline 107
GLP: yes
Remarks: Bioaccumulation is not expected.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment:-This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Components:

Formic acid:

Assessment : Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

12.6 Endocrine disrupting properties

Product:

Assessment:-The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological information : Forms corrosive mixtures with water even if diluted.
Harmful effect due to pH shift. Neutralisation possible in waste water treatment
Plants. No interference with wastewater treatment plants are to be expected when used properly. Discharge into the environment must be avoided.

Section 13: Disposal considerations

13.1 Waste treatment methods

Product : Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

Section 14: Transportation information

14.1 UN Number or ID number

ADR	UN 1779
IMDG	UN 1779
IATA	UN 1779

14.2 UN proper shipping name

ADR	FORMIC ACID
IMDG	FORMIC ACID
IATA	FORMIC ACID

14.3 Transport hazard class(es)

Class

ADR	8
IMDG	8
IATA	8

Subsidiary risks

ADR	3
IMDG	3
IATA	3

14.4 Packaging group

ADR

Packing group	II
Classification Code	CF1
Hazard Identification Number	83
Labels	8 (3)
Tunnel restriction code	(D/E)

IMDG

Packing group	II
Labels	8 (3)
EmS Code	F-E, S-C

IATA (Cargo)

Packing instruction (cargo aircraft)	855
Packing instruction (LQ)	Y840
Packing group	II
Labels	Class 8 - Corrosive substances, Class 3 - Flammable liquids

IATA_P (Passenger)

Packing instruction (passenger aircraft)	851
Packing instruction (LQ)	Y840
Packing group	II
Labels	Class 8 - Corrosive substances, Class 3 - Flammable

14.5 Environmental hazards

ADR

Environmentally hazardous	no
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IMDG

Marine pollutant	no
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14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

Section 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) : Conditions of restriction for the following entries should be Considered: Number on list 3 Number on list 40
This substance/mixture shall not be used in aerosol dispensers intended for supply to the general public for entertainment and decorative purposes. Number on list 75
If you intend to use this product as tattoo ink, please contact your vendor.

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : Not applicable

Regulation (EU) No 2024/590 on substances that deplete the ozone layer : Not applicable

Regulation (EU) 2019/1021 on persistent organic pollutants (recast) : Not applicable

REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. H2 ACUTE TOXIC

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

Section 16: Other information

Full text of H-Statements

H226	Flammable liquid and vapour.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
EUH071	Corrosive to the respiratory tract.
H226	Flammable liquid and vapour.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.

Further information

The information and recommendations in this SDS are to the best of our knowledge, information and belief accurate at the time of publication. Although utmost care is been taken in composition of this text, Highpuris LLC cannot be held responsible for any damage resulting from any possible error in this publication.