## SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Mixture identification: Hydrogen chloride in 1,4-dioxane 4M
Trade name: Hydrogen chloride in 1,4-dioxane 4M
UFI: 9701-RQ4P-820S-N23P

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

Recommended use:
Non-aqueous acid solvent

1.3. Details of the supplier of the safety data sheet

Company:
Gases: Research Innovation & Technology SLU.
C/ Consell de Cent, 419 Principal 1 y 2 - 08009 (Barcelona)
Tel: 93/272.14.00 Fax: 93/215.38.08

Competent person responsible for the safety data sheet:
gmartin@grit.es

1.4. Emergency telephone number

+ 34 630 215 910 (24h)

## SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

EC regulation criteria 1272/2008 (CLP)


Danger, Flam. Liq. 2, Highly flammable liquid and vapour.


Warning, Acute Tox. 4, Harmful if inhaled.


Danger, Skin Corr. 1A, Causes severe skin burns and eye damage.


Danger, Eye Dam. 1, Causes serious eye damage.


Warning, Carc. 2, Suspected of causing cancer if inhaled.


Warning, STOT SE 3, May cause respiratory irritation.


Warning, Met. Corr. 1, May be corrosive to metals.

Adverse physicochemical, human health and environmental effects:

No other hazards

2.2. Label elements

Hazard pictograms:

Danger

Hazard statements:

H225 Highly flammable liquid and vapour.
H290 May be corrosive to metals.
H332 Harmful if inhaled.
H314 Causes severe skin burns and eye damage.
H351 Suspected of causing cancer if inhaled.
H335 May cause respiratory irritation.

Precautionary statements:

P202 Do not handle until all safety precautions have been read and understood.
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.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a doctor.
P370+P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403+P235 Store in a well-ventilated place. Keep cool.

Special Provisions:
None

Contains
hydrogen chloride
1,4-dioxane

2.3. Other hazards

Other Hazards:
No other hazards

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances
N.A.

3.2. Mixtures
Hazardous components within the meaning of the CLP regulation and related classification:

| Qty | Name | Ident. Number | Classification |
|---|---|---|---|
| >= 80% - < 90% | 1,4-dioxane | Index number: 603-024-00-5<br>CAS: 123-91-1<br>EC: 204-661-8<br>REACH No.: 01-2119462837-26 |  2.6/2 Flam. Liq. 2 H225<br>  3.6/2 Carc. 2 H351<br>  3.3/2 Eye Irrit. 2 H319<br>  3.8/3 STOT SE 3 H335<br>EUH019<br>EUH066 |
| >= 12.5% - < 15% | hydrogen chloride | Index number: 017-002-00-2<br>CAS: 7647-01-0<br>EC: 231-595-7<br>REACH No.: 01-2119484862-27 |  2.5 Press. Gas H280<br>  3.2/1A Skin Corr. 1A H314<br>  3.1/3/Inhal Acute Tox. 3 H331<br>EUH071 |

## SECTION 4: First aid measures

4.1. Description of first aid measures
In case of skin contact:
Immediately take off all contaminated clothing.
OBTAIN IMMEDIATE MEDICAL ATTENTION.
Remove contaminated clothing immediately and dispose off safely.
After contact with skin, wash immediately with soap and plenty of water.
In case of eyes contact:
After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an opthalmologist immediately.
Protect uninjured eye.
In case of Ingestion:
Do NOT induce vomiting.
In case of Inhalation:
If breathing is irregular or stopped, administer artificial respiration.
In case of inhalation, consult a doctor immediately and show him packing or label.
4.2. Most important symptoms and effects, both acute and delayed
None
4.3. Indication of any immediate medical attention and special treatment needed
In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).
Treatment:
Treat symptomatically.

## SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media
Suitable extinguishing media:
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
Extinguishing media which must not be used for safety reasons:

DO NOT use a direct water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

Do not inhale explosion and combustion gases.
Burning produces heavy smoke.

5.3. Advice for firefighters

Use suitable breathing apparatus .
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Move undamaged containers from immediate hazard area if it can be done safely.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear personal protection equipment.
Remove all sources of ignition.
Wear breathing apparatus if exposed to vapours/dusts/aerosols.
Provide adequate ventilation.
Use appropriate respiratory protection.
See protective measures under point 7 and 8.

6.2. Environmental precautions

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.
Retain contaminated washing water and dispose it.
In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.
Suitable material for taking up: absorbing material, organic, sand

6.3. Methods and material for containment and cleaning up

Wash with plenty of water.

6.4. Reference to other sections

See also section 8 and 13

## SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid contact with skin and eyes, inhalation of vapours and mists.
Exercise the greatest care when handling or opening the container.
Use localized ventilation system.
Don't use empty container before they have been cleaned.
Before making transfer operations, assure that there aren't any incompatible material residuals in the containers.
Contamined clothing should be changed before entering eating areas.
Do not eat or drink while working.
See also section 8 for recommended protective equipment.

7.2. Conditions for safe storage, including any incompatibilities

Always keep in a well ventilated place.
Keep away from unguarded flame, sparks, and heat sources. Avoid direct exposure to sunlight.
Keep away from food, drink and feed.
Incompatible materials:
None in particular.
Instructions as regards storage premises:
Cool and adequately ventilated.

7.3. Specific end use(s)

None in particular

## SECTION 8: Exposure controls/personal protection

8.1. Control parameters

1,4-dioxane - CAS: 123-91-1

VLA-ED - TWA: 73 mg/m3, 20 ppm
EU - TWA(8h): 73 mg/m3, 20 ppm
ACGIH - TWA(8h): 20 ppm - Notes: Skin, A3 - Liver dam

hydrogen chloride - CAS: 7647-01-0

EU - TWA(8h): 8 mg/m3, 5 ppm - STEL: 15 mg/m3, 10 ppm
ACGIH - STEL: Ceiling 2 ppm - Notes: A4 - URT irr

DNEL Exposure Limit Values

1,4-dioxane - CAS: 123-91-1

Worker Professional: 144 mg/m3 - Exposure: Human Inhalation - Frequency: Long Term, local effects
Worker Professional: 73 mg/m3 - Exposure: Human Inhalation - Frequency: Long Term, systemic effects

Worker Professional: 21 mg/kg - Exposure: Human Dermal - Frequency: Long Term, systemic effects

PNEC Exposure Limit Values

8.2. Exposure controls

Eye protection:

Basket eye glasses.

Protection for skin:

Use clothing that provides comprehensive protection to the skin, e.g. cotton, rubber, PVC or viton.

Protection for hands:

Butyl caoutchouc (butyl rubber).

Respiratory protection:

Use respiratory protection where ventilation is insufficient or exposure is prolonged.

Use adequate protective respiratory equipment.

Thermal Hazards:

None

Environmental exposure controls:

None

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

| Properties | Value | Method: | Notes: |
|---|---|---|---|
| Appearance and colour: | Colorless liquid | -- | -- |
| Odour: | Indeterminate | -- | -- |
| Odour threshold: | N.A. | -- | -- |
| pH: | N.A. | -- | -- |
| Melting point / freezing point: | N.A. | -- | -- |
| Initial boiling point and boiling range: | N.A. | -- | -- |
| Flash point: | 17ºC | -- | -- |
| Evaporation rate: | N.A. | -- | -- |
| Solid/gas flammability: | N.A. | -- | -- |
| Upper/lower flammability or explosive limits: | Inf: 1.9 Vol % , Sup 22.5Vol% | -- | -- |
| Vapour pressure: | 41 hPa | -- | -- |
| Vapour density: | N.A. | -- | -- |
| Relative density: | 1.05 Kg/l | -- | -- |
| Solubility in water: | N.A. | -- | -- |
| Solubility in oil: | N.A. | -- | -- |
| Partition coefficient (n-octanol/water): | N.A. | -- | -- |
| Auto-ignition temperature: | no auto-FlamMable | -- | -- |
| Decomposition temperature: | N.A. | -- | -- |
| Viscosity: | N.A. | -- | -- |
| Explosive properties: | N.A. | -- | -- |
| Oxidizing properties: | N.A. | -- | -- |

9.2. Other information

| Properties | Value | Method: | Notes: |
|---|---|---|---|
| Miscibility: | N.A. | -- | -- |
| Fat Solubility: | N.A. | -- | -- |
| Conductivity: | N.A. | -- | -- |
| Substance Groups relevant properties | N.A. | -- | -- |

## SECTION 10: Stability and reactivity

10.1. Reactivity

It can form explosive peroxides

10.2. Chemical stability

Stable under normal conditions

10.3. Possibility of hazardous reactions

Produces peroxides in contact with strong oxidants.

10.4. Conditions to avoid

Stable under normal conditions.

10.5. Incompatible materials

Water / moisture, bases, oxidizing agents.

10.6. Hazardous decomposition products

CO, CO2

Hydrochloric acid (HCl)

## SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological information of the product:

N.A.

Toxicological information of the main substances found in the product:

1,4-dioxane - CAS: 123-91-1

a) acute toxicity:

Test: LC50 - Route: Oral - Species: Rat 5170 mg/kg

Test: LD50 - Route: Skin - Species: Rat 7855 mg/kg

Test: CL0 - Route: Inhalation - Species: Rat 38.8 mg/l - Duration: 4h

b) skin corrosion/irritation:

Test: Skin Irritant Negative

c) serious eye damage/irritation:

Test: Eye Irritant Positive

d) respiratory or skin sensitisation:

Test: Skin Sensitization Negative

e) germ cell mutagenicity:

Test: Mutagenesis Negative

f) carcinogenicity:

Test: Carcinogenicity Positive - Notes: (IARC) :2B

g) reproductive toxicity:

Test: Reproductive Toxicity Negative

h) STOT-single exposure:

Test: Respiratory Tract Irritant Positive

hydrogen chloride - CAS: 7647-01-0

a) acute toxicity:

Test: LC50 - Route: Inhalation Vapour - Species: Rat 2810 mg/kg - Duration: 1h

Test: LD50 - Route: Oral - Species: Rat 915 mg/kg

b) skin corrosion/irritation:

Test: Skin Corrosive - Route: Skin Positive - Notes: extremadamente corrosivo y destructivo para los tejidos

If not differently specified, the information required in Regulation 453/2010/EC listed below must be considered as N.A.:

a) acute toxicity;
b) skin corrosion/irritation;
c) serious eye damage/irritation;
d) respiratory or skin sensitisation;
e) germ cell mutagenicity;
f) carcinogenicity;
g) reproductive toxicity;
h) STOT-single exposure;
i) STOT-repeated exposure;
j) aspiration hazard.

## SECTION 12: Ecological information

12.1. Toxicity

Adopt good working practices, so that the product is not released into the environment.

1,4-dioxane - CAS: 123-91-1

a) Aquatic acute toxicity:

Endpoint: EC50 - Species: Daphnia > 1000 mg/l - Duration h: 48

Endpoint: EC50 - Species: Bacteria > 1000 mg/l - Duration h: 72

b) Aquatic chronic toxicity:

Endpoint: NOELR/21d - Species: Daphnia 1000 mg/l - Notes: (Directiva 211 de la OCDE, semiestático)

12.2. Persistence and degradability

Cloruro de Hidrógeno 4 M EN 1,4 Dioxano

1,4-dioxane - CAS: 123-91-1

hydrogen chloride - CAS: 7647-01-0

12.3. Bioaccumulative potential
N.A.

12.4. Mobility in soil
N.A.

12.5. Results of PBT and vPvB assessment
vPvB Substances: None - PBT Substances: None

12.6. Other adverse effects
None

## SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods
Recover, if possible. Send to authorised disposal plants or for incineration under controlled conditions.
In so doing, comply with the local and national regulations currently in force.

## SECTION 14. TRANSPORT INFORMATION

14.1. UN number

| | |
|---|---|
| ADR-UN Number: | 2924 |
| IATA-UN Number: | 2924 |
| IMDG-UN Number: | 2924 |

14.2. UN proper shipping name

| | |
|---|---|
| ADR-Shipping Name: | FLAMMABLE LIQUID, CORROSIVE, N.O.S.(CLORURO DE HIDRÓGENO ANHIDRO, 1,4-DIOXANO) |
| IATA-Shipping Name: | FLAMMABLE LIQUID, CORROSIVE, N.O.S.(CLORURO DE HIDRÓGENO ANHIDRO, 1,4-DIOXANO) |
| IMDG-Shipping Name: | FLAMMABLE LIQUID, CORROSIVE, N.O.S.(CLORURO DE HIDRÓGENO ANHIDRO, 1,4-DIOXANO) |

14.3. Transport hazard class(es)

| | |
|---|---|
| ADR-Class: | 3 |
| ADR - Hazard identification number: | 338 |
| IATA-Class: | 3 |
| IMDG-Class: | 3 |

14.4. Packing group

| | |
|---|---|
| ADR-Packing Group: | II |
| IATA-Packing group: | II |
| IMDG-Packing group: | II |

14.5. Environmental hazards

| | |
|---|---|
| ADR-Enviromental Pollutant: | No |
| IMDG-Marine pollutant: | No |

14.6. Special precautions for user

| | |
|---|---|
| ADR-Subsidiary risks: | 8 |
| ADR-S.P.: | 274 |
| ADR-Transport category (Tunnel restriction code): | 2 (D/E) |
| IATA-Passenger Aircraft: | 352 |
| IATA-Subsidiary risks: | 8 |
| IATA-Cargo Aircraft: | 363 |
| IATA-S.P.: | A3 A803 |
| IATA-ERG: | 3CH |
| IMDG-EmS: | F-E , S-C |
| IMDG-Subsidiary risks: | 8 |
| IMDG-Stowage and handling: | Category B |
| IMDG-Segregation: | Clear of living quarters. |

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

## SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Dir. 98/24/EC (Risks related to chemical agents at work)

Dir. 2000/39/EC (Occupational exposure limit values)
Regulation (EC) n. 1907/2006 (REACH)
Regulation (EC) n. 1272/2008 (CLP)
Regulation (EC) n. 790/2009 (ATP 1 CLP) and (EU) n. 758/2013
Regulation (EU) n. 2015/830
Regulation (EU) n. 286/2011 (ATP 2 CLP)
Regulation (EU) n. 618/2012 (ATP 3 CLP)
Regulation (EU) n. 487/2013 (ATP 4 CLP)
Regulation (EU) n. 944/2013 (ATP 5 CLP)
Regulation (EU) n. 605/2014 (ATP 6 CLP)
Regulation (EU) n. 2015/1221 (ATP 7 CLP)
Regulation (EU) n. 2016/918 (ATP 8 CLP)
Regulation (EU) n. 2016/1179 (ATP 9 CLP)
Regulation (EU) n. 2017/776 (ATP 10 CLP)
Regulation (UE) n. 2018/669 (ATP 11 CLP)
Regulation (UE) n. 2018/1480 (ATP 13 CLP)
Regulation (UE) n. 2019/521 (ATP 12 CLP)

Restrictions related to the product or the substances contained according to Annex XVII Regulation (EC) 1907/2006 (REACH) and subsequent modifications:

Restrictions related to the product:

Restriction 3
Restriction 40

Restrictions related to the substances contained:

No restriction.

List of candidate substances of very high concern in the authorisation procedure, in accordance with Article 59 of Regulation (EC) 1907/2006 (REACH):

The product contains substances of very high concern that are candidates for inclusion in Annex XIV to Regulation (EC) 1907/2006 (REACH):

1,4-Dioxane (Decision D(2021)4569-DC)

Where applicable, refer to the following regulatory provisions :

Directive 2012/18/EU (Seveso III)
Regulation (EC) nr 648/2004 (detergents).
Dir. 2004/42/EC (VOC directive)

Provisions related to directive EU 2012/18 (Seveso III):

Seveso III category according to Annex 1, part 1

Product belongs to category: P5c

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out for the mixture.

## SECTION 16: Other information

Full text of phrases referred to in Section 3:

H225 Highly flammable liquid and vapour.
H351 Suspected of causing cancer.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
EUH019 May form explosive peroxides.
EUH066 Repeated exposure may cause skin dryness or cracking.
H280 Contains gas under pressure; may explode if heated.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled.
EUH071 Corrosive to the respiratory tract.

| Hazard class and hazard category | Code | Description |
|---|---|---|
| Press. Gas | 2.5 | Gases under pressure |
| Flam. Liq. 2 | 2.6/2 | Flammable liquid, Category 2 |
| Acute Tox. 3 | 3.1/3/Inhal | Acute toxicity (inhalation), Category 3 |
| Acute Tox. 4 | 3.1/4/Inhal | Acute toxicity (inhalation), Category 4 |
| Skin Corr. 1A | 3.2/1A | Skin corrosion, Category 1A |
| Eye Dam. 1 | 3.3/1 | Serious eye damage, Category 1 |
| Eye Irrit. 2 | 3.3/2 | Eye irritation, Category 2 |
| Carc. 2 | 3.6/2 | Carcinogenicity, Category 2 |
| STOT SE 3 | 3.8/3 | Specific target organ toxicity - single exposure, Category 3 |

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

| Classification according to Regulation (EC) Nr. 1272/2008 | Classification procedure |
|---|---|
| Flam. Liq. 2, H225 | On basis of test data |
| Met. Corr. 1, H290 | Calculation method |
| Acute Tox. 4, H332 | Calculation method |
| Skin Corr. 1A, H314 | Calculation method |
| Eye Dam. 1, H318 | Calculation method |
| Carc. 2, H351 | Calculation method |
| STOT SE 3, H335 | Calculation method |

Paragraphs modified since the previous revision:

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

This document was prepared by a competent person who has received appropriate training.

**Main bibliographic sources:**

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities

SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van Nostrand Reinold

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.
It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

**This MSDS cancels and replaces any preceding release.**

| | |
|---|---|
| ADR: | European Agreement concerning the International Carriage of Dangerous Goods by Road. |
| CAS: | Chemical Abstracts Service (division of the American Chemical Society). |
| CLP: | Classification, Labeling, Packaging. |
| DNEL: | Derived No Effect Level. |
| EINECS: | European Inventory of Existing Commercial Chemical Substances. |
| GefStoffVO: | Ordinance on Hazardous Substances, Germany. |
| GHS: | Globally Harmonized System of Classification and Labeling of Chemicals. |
| IATA: | International Air Transport Association. |
| IATA-DGR: | Dangerous Goods Regulation by the "International Air Transport Association" (IATA). |
| ICAO: | International Civil Aviation Organization. |
| ICAO-TI: | Technical Instructions by the "International Civil Aviation Organization" (ICAO). |
| IMDG: | International Maritime Code for Dangerous Goods. |
| INCI: | International Nomenclature of Cosmetic Ingredients. |
| KSt: | Explosion coefficient. |
| LC50: | Lethal concentration, for 50 percent of test population. |
| LD50: | Lethal dose, for 50 percent of test population. |
| PNEC: | Predicted No Effect Concentration. |
| RID: | Regulation Concerning the International Transport of Dangerous Goods by Rail. |
| STEL: | Short Term Exposure limit. |
| STOT: | Specific Target Organ Toxicity. |
| TLV: | Threshold Limiting Value. |
| TWA: | Time-weighted average |
| WGK: | German Water Hazard Class. |