Safety Data Sheet

according to Regulations REACh 1907/2006/EC

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

1.1 Product identifier

REF 814200
Product name TLC Micro Set F 1

REACH Registration number(s): see SECTION 3.1/3.2 or
A registration number for the substance(s) does not exist because the annual tonnage does not require registration or the substance or its use is excluded from registration.

1 x 100 mL n-Butanol
1 x 100 mL Ninhydrin spray reagent UFI: V12V-730F-520P-89PH
1 x 100 mL Acetone
1 x 100 mL Rubeanic acid spray reagent UFI: 992V-R32N-3205-7AEQ
1 x 100 mL Ammonia solution 25%
1 x 50 mL Acetic acid 50%
1 x 50 mL Hydrochloric acid 18%
1 x 8 mL Amino acid test mixture
1 x 8 mL Cation test mixture (heavy metals)
1 x 8 mL Reference solution Manganese
1 x 8 mL Reference solution Copper
1 x 8 ml TLC Reference Solution (A) Arginine
1 x 8 ml TLC Reference Solution (B) Tryptophane

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

Relevant identified uses
Product for analytical use.
Exposure Scenario Classification according REACh, RIP 3.2 Codes: SU 0-2, PC 21, PROC 15, AC 0
The exposure scenario is integrated into sections 1-16.
Uses advised against
not described

1.3 Details of the supplier of the safety data sheet

Manufactured by:
MACHEREY-NAGEL GmbH & Co. KG
Valencienner Str. 11, 52355 Düren, Germany
Phone: +49 2421 969 0 E-mail: sds@mn-net.com (msds@mn-net.com)

1.4 Emergency telephone number

Outside Germany (DE): Call your regional Poisons Information Service or call local Life Saving Service.
DE: Gemeinsames Giftinformationszentrum (GGIZ)
99089 Erfurt tel. +49 361 730 730, **<https://www.ggiz-erfurt.de>**

You find our current versions of SDS in Internet: **<http://www.mn-net.com/SDS>**

SECTION 2: Hazard identification

2.0 Classification of the complete product according to Regulation (EC) 1272/2008



GHS02 GHS05 GHS07 GHS09

Signal word DANGER

Hazard identification	Hazard classes/categories
H225	Flam. Liq. 2
H302	Acute Tox. 4 oral
H314	Skin Corr. 1B
H335	STOT SE 3
H336	STOT SE 3
H400	Aquatic Acute 1
EUH066	Skin Irrit. 2

2.1 Classification of the substance or mixture according to Regulation (EC) 1272/2008

8 mL Cation test mixture (heavy metals)

Do not need labelling as hazardous

Signal word -

No hazard class

8 mL Reference solution Manganese

Do not need labelling as hazardous

Signal word -

No hazard class

100 mL Ammonia solution 25%



GHS05 GHS07 GHS09

Signal word DANGER

Hazard identification	Hazard classes/categories
H314	Skin Corr. 1B
H335	STOT SE 3
H400	Aquatic Acute 1

8 mL Amino acid test mixture

Do not need labelling as hazardous

Signal word -

No hazard class

100 mL Ninhydrin spray reagent



GHS02

Signal word DANGER

Hazard identification	Hazard classes/categories
H225	Flam. Liq. 2

100 mL Rubeanic acid spray reagent



GHS02

Signal word DANGER

Hazard identification	Hazard classes/categories
H225	Flam. Liq. 2

50 mL Acetic acid 50%



GHS05

Signal word DANGER

Hazard identification	Hazard classes/categories
H314	Skin Corr. 1B

100 mL Acetone



GHS02 GHS07

Signal word DANGER

Hazard identification	Hazard classes/categories
EUH066	Skin Irrit. 2
H225	Flam. Liq. 2
H319	Eye Irrit. 2
H336	STOT SE 3

100 mL n-Butanol



GHS02 GHS05 GHS07

Signal word DANGER

Hazard identification	Hazard classes/categories
H226	Flam. Liq. 3
H302	Acute Tox. 4 oral
H315	Skin Irrit. 2
H318	Eye Dam. 1
H335	STOT SE 3
H336	STOT SE 3

8 ml TLC Reference Solution (A) Arginine

Do not need labelling as hazardous

Signal word -

No hazard class

8 ml TLC Reference Solution (B) Tryptophane

Do not need labelling as hazardous

Signal word -

No hazard class

50 mL Hydrochloric acid 18%



GHS07

Signal word WARNING

Hazard identification	Hazard classes/categories
H315	Skin Irrit. 2
H319	Eye Irrit. 2
H335	STOT SE 3

8 mL Reference solution Copper

Do not need labelling as hazardous

Signal word -

No hazard class

List of H phrases: see section 16.2

2.2 Label elements according regulation (EC) 1272/2008

According **CLP directive** inner packages must be only labelled with GHS symbol(s) and product identificator(s) (EU 1272/2008 Annex I - 1.5.1.2). Harmful chemicals/mixtures with signal word: **WARNING** and highly flammable chemicals/mixtures must not be labelled with H and P phrases **until 125 mL** (EU 1272/2008 Annex I - 1.5.2).

8 mL Cation test mixture (heavy metals)

Do not need labelling as hazardous
Signal word: -

8 mL Reference solution Manganese

Do not need labelling as hazardous
Signal word: -

100 mL Ammonia solution 25%



GHS05 GHS07 GHS09

Signal word: DANGER
H314
Causes severe skin burns and eye damage.
P260sh, P280sh, P303+361+353, P305+351+338, P310
Do not breathe dust/vapours.Wear protective gloves/eye protection.IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.Immediately call a POISON CENTER/doctor.

8 mL Amino acid test mixture

Do not need labelling as hazardous
Signal word: -

100 mL Ninhydrin spray reagent



GHS02

Signal word: DANGER

100 mL Rubeanic acid spray reagent



GHS02

Signal word: DANGER

50 mL Acetic acid 50%



GHS05

Signal word: DANGER
H314
Causes severe skin burns and eye damage.
P260sh, P280sh, P303+361+353, P305+351+338, P310
Do not breathe dust/vapours.Wear protective gloves/eye protection.IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.Immediately call a POISON CENTER/doctor.

100 mL Acetone



GHS02 GHS07

Signal word: DANGER

100 mL n-Butanol



GHS02 GHS05

Signal word: DANGER
H318
Causes serious eye damage.
P280sh, P305+351+338, P310
Wear protective gloves/eye protection.IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.Immediately call a POISON CENTER/doctor.

8 ml TLC Reference Solution (A) Arginine

Do not need labelling as hazardous
Signal word: -

8 ml TLC Reference Solution (B) Tryptophane

Do not need labelling as hazardous
Signal word: -

50 mL Hydrochloric acid 18%



GHS07

Signal word: WARNING

8 mL Reference solution Copper

Do not need labelling as hazardous
Signal word: -

Label elements of the complete product



GHS02 GHS05 GHS09

Signal word: DANGER
H314
Causes severe skin burns and eye damage.
P260sh, P280sh, P303+361+353, P305+351+338, P310
Do not breathe dust/vapours.Wear protective gloves/eye protection.IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.Immediately call a POISON CENTER/doctor.

2.3 Other hazards

Possible hazards from physicochemical properties
Generally in the case of pH values are less than 2 or higher than 11.5 then it is corrosive. In the case of pH values are less than 5 or higher than 9 then it is irritant. Flammable properties.

Information pertaining to particular risks to human and possible symptoms
Causes varying degrees of acid burns on the skin, to the eyes and to the mucous membranes and wounds which do not heal quickly depending on the concentration, temperature and the exposure time. Vapours especially which steam from hot liquids and mist can have a severe irritant effect upon the eyes and the respiratory organs.
Cause after oral intake, inhalation of vapours/dust, impairments of health when ingested in small quantities.

Information pertaining to particular risks to the environment
Avoid contact of substance/mixture to environment.
PBT: not applicable
vPvB: not applicable

Possible endocrine disrupting effects
no data available

SECTION 3: Composition / information on ingredients

3.1 Substances or 3.2 Mixtures

50 mL Acetic acid 50%

Substance name: *acetic acid*
CAS No.: 64-19-7

Substance rating: H226, Flam. Liq. 3, H314, Skin Corr. 1A, H318, Eye Dam. 1
Formula: $C_2H_4O_2$; CH_3-COOH
REACH Reg. No.: 01-2119475328-30-xxxx
EC No.: 200-580-7 Indice No.: 607-002-00-6
Concentration: 25 - <50 %
acc. CLP (GHS): H314, Skin Corr. 1B, H318, Eye Dam. 1

50 mL Hydrochloric acid 18%

Substance name: *hydrochloric acid*
CAS No.: 7647-01-0

Substance rating: H314, Skin Corr. 1A, H335, STOT SE 3
Formula: $HCl \cdot H_2O$
Pseudonym (de): Chlorwasserstoffsäure
REACH Reg. No.: 01-2119484862-27-xxxx
EC No.: 231-595-7 Indice No.: 017-002-01-X
Specific concentration limit: Eye Irrit. 2; H319: 10 % ≤ C < 25 % - Skin Irrit. 2; H315: 10 % ≤ C < 25 % - Skin Corr. 1B; H314: C ≥ 25 % - STOT SE 3; H335: C ≥ 10 %
Concentration: 10 - <25 %
acc. CLP (GHS): H315, Skin Irrit. 2, H319, Eye Irrit. 2, H335, STOT SE 3

8 mL Amino acid test mixture

Substance name: *water*
CAS No.: 7732-18-5

Substance rating: No criteria for classification or naming of chemical not required.
Formula: H_2O
REACH Reg. No.: exempt, Annex IV
EC No.: 231-791-2
Concentration: 90 - <100 %
acc. CLP (GHS): The criteria for classification are not fulfilled.

8 ml TLC Reference Solution (A) Arginine

Substance name: *water*
CAS No.: 7732-18-5

Substance rating: No criteria for classification or naming of chemical not required.
Formula: H_2O
REACH Reg. No.: exempt, Annex IV
EC No.: 231-791-2
Concentration: 90 - <100 %
acc. CLP (GHS): The criteria for classification are not fulfilled.

8 ml TLC Reference Solution (B) Tryptophane

Substance name: *water*
CAS No.: 7732-18-5

Substance rating: No criteria for classification or naming of chemical not required.
Formula: H_2O
REACH Reg. No.: exempt, Annex IV
EC No.: 231-791-2
Concentration: 90 - <100 %
acc. CLP (GHS): The criteria for classification are not fulfilled.

100 mL Ninhydrin spray reagent

Substance name: *ethanol*
CAS No.: 64-17-5
(denatured with 1% 2-butanone / 1% 2-propanol)
Substance rating: H225, Flam. Liq. 2
Formula: C_2H_6O; C_2H_5OH
Pseudonym (de): Äthylalkohol, vergällter Spiritus
REACH Reg. No.: 01-2119457610-43-xxxx
EC No.: 200-578-6 Indice No.: 603-002-00-5
Concentration: 90 - <100 %
acc. CLP (GHS): H225, Flam. Liq. 2

Substance name: *ninhydrin*
CAS No.: 485-47-2

Substance rating: H302, Acute Tox. 4 oral, H315, Skin Irrit. 2, H319, Eye Irrit. 2, H335, STOT SE 3
Formula: $C_9H_6O_4$
Pseudonym (de): 1,2,3-Indantrionhydrat
EC No.: 207-618-1
Concentration: 0,1 - <1 %
acc. CLP (GHS): The criteria for classification are not fulfilled.

100 mL Rubeanic acid spray reagent

Substance name: *ethanol*
CAS No.: 64-17-5
(denatured with 1% 2-butanone / 1% 2-propanol)
Substance rating: H225, Flam. Liq. 2
Formula: C_2H_6O; C_2H_5OH
Pseudonym (de): Äthylalkohol, vergällter Spiritus
REACH Reg. No.: 01-2119457610-43-xxxx
EC No.: 200-578-6 Indice No.: 603-002-00-5
Concentration: 90 - <100 %
acc. CLP (GHS): H225, Flam. Liq. 2

Substance name: *rubeanic acid*
CAS No.: 79-40-3

Substance rating: H302, Acute Tox. 4 oral
Formula: $C_2H_4N_2S_2$
Pseudonym (de): Dithiooxamid
EC No.: 201-203-9
Concentration: 0,1 - <1 %
acc. CLP (GHS): The criteria for classification are not fulfilled.

8 mL Cation test mixture (heavy metals)

Substance name: *manganese(II) sulfate (monohydrate)*
CAS No.: 10034-96-5

Substance rating: H373, STOT RE 2, H411, Aquatic Chronic 2
Formula: $MnSO_4 \cdot H_2O$
REACH Reg. No.: 01-2119456624-35-xxxx
EC No.: 232-089-9 Indice No.: 025-003-00-4
Concentration: 0,1 - <1 % Correlation factor: x 0.36 (= %Mn)
The classification refers to the weight percentage of the metal (according to CLP regulation 2008/1272/EG Annex VI, 1.1.3.2 Note 1)
acc. CLP (GHS): The criteria for classification are not fulfilled.

Substance name: *copper(II) sulfate (pentahydrate)*
CAS No.: 7758-98-7

Substance rating: H302, Acute Tox. 4 oral, H315, Skin Irrit. 2, H319, Eye Irrit. 2, H400, Aquatic Acute 1, H410, Aquatic Chronic 1
Formula: $CuSO_4$
Pseudonym (de): Kupfervitriol
REACH Reg. No.: 01-2119520566-40-xxxx
EC No.: 231-847-6 Indice No.: 029-004-00-0
Concentration: 0,1 - <1 % Correlation factor: x 0.40 (= %Cu)
The classification refers to the weight percentage of the metal (according to CLP regulation 2008/1272/EG Annex VI, 1.1.3.2 Note 1)
acc. CLP (GHS): The criteria for classification are not fulfilled.

8 mL Reference solution Manganese

Substance name: *manganese(II) sulfate (monohydrate)*
CAS No.: 10034-96-5

Substance rating: H373, STOT RE 2, H411, Aquatic Chronic 2
Formula: $MnSO_4 \cdot H_2O$
REACH Reg. No.: 01-2119456624-35-xxxx
EC No.: 232-089-9 Indice No.: 025-003-00-4
Concentration: 0,1 - <1 % Correlation factor: x 0.36 (= %Mn)
The classification refers to the weight percentage of the metal (according to CLP regulation 2008/1272/EG Annex VI, 1.1.3.2 Note 1)
acc. CLP (GHS): The criteria for classification are not fulfilled.

100 mL Ammonia solution 25%

Substance name: *ammonia solution*
CAS No.: 1336-21-6

Substance rating: H314, Skin Corr. 1B, H335, STOT SE 3, H400, Aquatic Acute 1
Formula: $NH_3 \cdot H_2O$
Pseudonym (de): Salmiakgeist
REACH Reg. No.: 01-2119488876-14-xxxx, 01-2119982985-14-XXXX
EC No.: 215-647-6 Indice No.: 007-001-01-2
Concentration: 16 - <25 %
acc. CLP (GHS): H314, Skin Corr. 1B, H335, STOT SE 3, H400, Aquatic Acute 1

8 mL Reference solution Copper

Substance name: *copper(II) sulfate (pentahydrate)*
CAS No.: 7758-98-7

Substance rating: H302, Acute Tox. 4 oral, H315, Skin Irrit. 2, H319, Eye Irrit. 2, H400, Aquatic Acute 1, H410, Aquatic Chronic 1
Formula: $CuSO_4$
Pseudonym (de): Kupfervitriol
REACH Reg. No.: 01-2119520566-40-xxxx
EC No.: 231-847-6 Indice No.: 029-004-00-0
Concentration: 0,1 - <1 % Correlation factor: x 0.40 (= %Cu)
The classification refers to the weight percentage of the metal (according to CLP regulation 2008/1272/EG Annex VI, 1.1.3.2 Note 1)
acc. CLP (GHS): The criteria for classification are not fulfilled.

100 mL Acetone

Substance name: *acetone*
CAS No.: 67-64-1

Substance rating: H225, Flam. Liq. 2, H319, Eye Irrit. 2, H336, STOT SE 3, EUH066, Skin Irrit. 2
Formula: C_3H_6O; $(CH_3)_2$-CO
Pseudonym (de): 2-Propanon
REACH Reg. No.: 01-2119471330-49-xxxx
EC No.: 200-662-2 Indice No.: 606-001-00-8
Concentration: 80 - <100 %
acc. CLP (GHS): H225, Flam. Liq. 2, H319, Eye Irrit. 2, H336, STOT SE 3, EUH066, Skin Irrit. 2

100 mL n-Butanol

Substance name: *1-butanol*
CAS No.: 71-36-3

Substance rating: H226, Flam. Liq. 3, H302, Acute Tox. 4 oral, H315, Skin Irrit. 2, H318, Eye Dam. 1, H335, STOT SE 3, H336, STOT SE 3
Formula: $C_4H_{10}O$; $CH_3(CH_2)_3OH$
Pseudonym (de): n-Butylalkohol, Butan-1-ol
REACH Reg. No.: 01-2119484630-38-xxxx
EC No.: 200-751-8 Indice No.: 603-004-00-6
Concentration: 90 - <100 %
acc. CLP (GHS): H226, Flam. Liq. 3, H302, Acute Tox. 4 oral, H315, Skin Irrit. 2, H318, Eye Dam. 1, H335, STOT SE 3, H336, STOT SE 3

3.3 Remarks

When not listed, mixtures are added with water [CAS No. 7732-18-5] to 100%.List of H and P phrases: see section 16.2.

SECTION 4: First aid measures

4.1 Description of first aid measures

Place insured person out of danger zone to fresh air immediately. Ensure quiet, warmth, and provide resuscitation if necessary. If necessary contact medical advice. Remove contaminated clothing. Show product package, packing insert and this material safety data sheet to the doctor.

4.1.1 After SKIN Contact

Remove contaminated clothing immediately. Rinse the affected skin or mucous membrane thoroughly for min. 15 minutes under running water. (If possible) use soap. Avoid neutralisation. Then apply a loose bandage.

4.1.2 After EYE Contact

After contact with the eyes rinse thoroughly under running water with the eyelid wide open for min. 10 minutes with eye washing bottle, eye douche or running water (protect intact eye). Before (if possible) apply eye drops Proxymetacaine 0.5%, if the opening the eyelid convulsion is painful. Further treatment to be carried out by an eye specialist.

4.1.3 After INHALATION of vapours

After inhalation of foam or vapour fresh air should be inhaled. Keep airways free. If vomiting and if insensible place patient in recovery position and keep airways free. ---

4.1.4 After ORAL Intake

After oral intake lots of water with activated charcoal supplement should be drunk after it has been ingested. Do not induce vomiting under any circumstances. Do not make any efforts to neutralise it. Contact medical advice for possible consequences.

4.2 Most important symptoms and effects, both acute and delayed

Rapid penetration and destruction of the skin. Especially in the heated form.
Causes severe skin burns and eye damage.

4.3 Indication of any immediate medical attention and special treatment needed

CORROSIVE DAMAGE: After SKIN CONTACT rinse with water for a long time. Efforts to neutralise the substance can frequently make matters worse. Apply glucocorticosteroides following inflammatory reactions. After EYE CONTACT rinse immediately with plenty of water for a long time. Eyelid convulsion measures. Name the corrosive chemical. Further treatment must to be carried out by an eye specialist. After INTAKE administer aluminium oxide drug suspensions. Administer a prophylaxis to counter pulmonary oedema following the INGESTION of corrosive aerosols. In the event of RESPIRATORY DISTREES ensure that the patient inhales oxygen. ---

SECTION 5: Firefighting measures

5.1 Extinguishing media

5.1.1 Suitable extinguishing media

Fire extinguishers appropriate to the fire classification, and, if applicable, a fire blanket must be available in a prominent location in the work area. All extinguishers like FOAM, WATER SPRAY, DRY POWDER, CARBON DIOXIDE can be used.

5.1.2 Unsuitable extinguishing media

no data available

5.2 Special hazards arising from the substance or mixture

DANGER: Highly flammable (GHS regulation). Forms explosive vapour-air mixtures. Formation of hazardous and caustic vapour-air mixtures possible.

5.3 Advice for firefighters

No, for listed product.Product package burns like paper or plastic. Spray any vapours released with water. Retent fire water. Use only acid-resistant safety equipment.
For great amount - if necessary - protective breathing apparatus which is independent of the ambient air (isolated equipment), and sealed protective clothing is necessary in the event of a large-scale formation of toxic substances.

5.4 Additional information

Danger for environment **only in the event of a large-scale leakage** or formation of hazardous substances.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Do not breathe vapours. Wear suitable protective gloves (see 8.2.2). Wear eye protection, respectively face protection. Regular staff training is necessary, indicating hazards and precautions on the basis of operating instructions. Restrictions on activity must be observed.

6.2 Environmental precautions

Avoid contact of substance/mixture to environment.

PBT: not applicable
vPvB: not applicable

6.3 Methods and material for containment and cleaning up

Bind any escaping liquid with inert absorbent. And dispose in accordance to local regulations for the disposal of hazardous chemicals.
Clean any contaminated equipment and floors with plenty of water.
Collect small amounts of leaked liquid and flush with water into drains.

6.4 Reference to other sections

see information in section 5.4,7,8 and 13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Handling in accordance with the test instruction, that comes with the product.

7.2 Conditions for safe storage, including any incompatibilities

Safe storage is guaranteed in the original packaging . Storage class (German chemical industry): see chapter 12.1

Storage class (VCI): 3
Water hazard class (DE): 2

7.2.1 Requirements for stock rooms and containers

Keep original product packages tightly closed during handling and storage. Use inbreakable container for transport of glass bottles.

7.3 Specific end use(s)

Product for analytical use.

SECTION 8: Exposure controls /personal protection

8.1 Control parameters

50 mL Acetic acid 50%

Chemical: *acetic acid* CAS No.: 64-19-7

DNEL: [loc, inh] 25 mg/m³
DNEL = Derived No-Effect Level (for workers)

PNEC (fresh water) : 3.058 mg/L
PNEC = Predicted No Effected Concentration

EU value: [TWA] 25 / [STEL] 50 mg/m³

TRGS 900 (DE): 10 mL/m³ / 25 mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 2(I), Y
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

SUVA(CH) MAK value: 10 ppm / 25 mg/m³

NIOSH: [TWA] 10 ppm / 25 mg/m ^{3} ; [STEL] 15 ppm / 37 mg/m³
[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA: [TWA] 10 ppm / 25 mg/m³

50 mL Hydrochloric acid 18%

Chemical: *hydrochloric acid* CAS No.: 7647-01-0

DNEL: [inh] 8 mg/m³
DNEL = Derived No-Effect Level (for workers)

PNEC (fresh water) : 36 µg/L
PNEC = Predicted No Effected Concentration

EU value: [TWA] 5 ppm / 8 mg/m ^{3} ; [STEL] 10 ppm/ 15 mg/m³

TRGS 900 (DE): 2 mL/m³ / 3 mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 2 (I), Y
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

SUVA(CH) MAK value: 2 ppm / 3* mg/m³

NIOSH: [C] 5 ppm / 7 mg/m³

[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA: List of highly hazardous chemicals, toxics and reactives Yes (TQ = 5000 lbs) n/a; TWA 5 ppm / 7 mg/m³

8 mL Amino acid test mixture

Chemical: *water* CAS No.: 7732-18-5

8 ml TLC Reference Solution (A) Arginine

Chemical: *water* CAS No.: 7732-18-5

8 ml TLC Reference Solution (B) Tryptophane

Chemical: *water* CAS No.: 7732-18-5

100 mL Ninhydrin spray reagent

Chemical: *ethanol* CAS No.: 64-17-5

DNEL: [derm] 343 mg/kg; [inh] 950 mg/m³
DNEL = Derived No-Effect Level (for workers)

PNEC (fresh water) : 0.96 mg/L
PNEC = Predicted No Effected Concentration

TRGS 900 (DE): 200 mL/m³ / 380 mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 4 (II), Y
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

SUVA(CH) MAK value: 500 ppm / 960 mg/m³

NIOSH: [TWA] 1000 ppm / 1900 mg/m³
[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA: [TWA] 1000 ppm / 1900 mg/m³

Chemical: *ninhydrin* CAS No.: 485-47-2

100 mL Rubeanic acid spray reagent

Chemical: *ethanol* CAS No.: 64-17-5

DNEL: [derm] 343 mg/kg; [inh] 950 mg/m³
DNEL = Derived No-Effect Level (for workers)

PNEC (fresh water) : 0.96 mg/L
PNEC = Predicted No Effected Concentration

TRGS 900 (DE): 200 mL/m³ / 380 mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 4 (II), Y
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

SUVA(CH) MAK value: 500 ppm / 960 mg/m³

NIOSH: [TWA] 1000 ppm / 1900 mg/m³
[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA: [TWA] 1000 ppm / 1900 mg/m³

Chemical: *rubeanic acid* CAS No.: 79-40-3

8 mL Cation test mixture (heavy metals)

Chemical: *manganese(II) sulfate (monohydrate)* CAS No.: 10034-96-5

EU value: [Mn, TWA] 0.2E / 0.05A mg/m³

TRGS 900 (DE): [Mn] 0.02A; 0.2E mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 8 (II), Y
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

TRGS 903 (DE): nicht mehr gelistet
B blood, U urine, a no limitation, b end of exposition or shift

NIOSH: [TWA] 1 / [STEL] 3 mg/m³
[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA: [C] 5 mg/m³

Chemical: *copper(II) sulfate (pentahydrate)* CAS No.: 7758-98-7

TRGS 900 (DE): 1 (0,1) E mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 4
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

SUVA(CH) MAK value: [als Cu][MAK]0,1 e/[STEL] 0,2 e mg/m³

8 mL Reference solution Manganese

Chemical: *manganese(II) sulfate (monohydrate)* CAS No.: 10034-96-5

EU value: [Mn, TWA] 0.2E / 0.05A mg/m³

TRGS 900 (DE): [Mn] 0.02A; 0.2E mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 8 (II), Y
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

TRGS 903 (DE): nicht mehr gelistet
B blood, U urine, a no limitation, b end of exposition or shift

NIOSH: [TWA] 1 / [STEL] 3 mg/m³
[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA: [C] 5 mg/m³

100 mL Ammonia solution 25%

Chemical: *ammonia solution* CAS No.: 1336-21-6

DNEL: [inh] 14 mg/m³
DNEL = Derived No-Effect Level (for workers)

PNEC (fresh water) : 0.0011 mg/L
PNEC = Predicted No Effected Concentration

EU value: 20 ppm / 14 mg/m³

TRGS 900 (DE): 20 ppm / 14 mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 2 (I), Y
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

SUVA(CH) MAK value: 20 ppm / 14 mg/m³

NIOSH: [TWA] 25 ppm / 18 mg/m³

NIOSH STEL: 35 ppm / 27 mg/m³
[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA: Yes (TQ = 15000 lbs) - n/a; [TWA] 50 ppm / 35 mg/m³

8 mL Reference solution Copper

Chemical: *copper(II) sulfate (pentahydrate)* CAS No.: 7758-98-7

TRGS 900 (DE): 1 (0,1) E mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 4
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

SUVA(CH) MAK value: [als Cu][MAK]0,1 e/[STEL] 0,2 e mg/m³

100 mL Acetone

Chemical: *acetone* CAS No.: 67-64-1

DNEL: [inh] (1210) mg/m³
DNEL = Derived No-Effect Level (for workers)

PNEC (fresh water) : 10.6 mg/L
PNEC = Predicted No Effected Concentration

EU value: 500 ppm / 1200 mg/m³

TRGS 900 (DE): 500 mL/m³ / 1200 mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 2 (I), Y
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

SUVA(CH) MAK value: 500 ppm/ 1200 mg/m³

SUVA(CH) BAT value: [U/b] 80 mg/L

TRGS 903 (DE): [U/b] 80 mg/L
B blood, U urine, a no limitation, b end of exposition or shift

NIOSH: [TWA] 250 ppm / [STEL] 590 mg/m³
[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA: [TWA] 1000 ppm / [STEL] 2400 mg/m³

100 mL n-Butanol

Chemical: *1-butanol* CAS No.: 71-36-3

DNEL: [inh] 310 mg/m³
DNEL = Derived No-Effect Level (for workers)

PNEC (fresh water) : 0,082 mg/L
PNEC = Predicted No Effected Concentration

TRGS 900 (DE): 100 ppm / 310 mg/m³
A/a aveoles passing, E/e respirable, G total

Short-term exposure factor: 1 (I), Y
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded

SUVA(CH) MAK value: 50 ppm / 150 mg/m³

TRGS 903 (DE): [Kreatinin] U/d 2; U/b 10 mg/g
B blood, U urine, a no limitation, b end of exposition or shift

NIOSH: C [skin] 50 ppm / 150 mg/m³
[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA: [TWA] 100 ppm / 300 mg/m³

8.2 Exposure controls

Good ventilation and extraction system in the room, floor resistant to chemicals with floor drainage and washing facilities. The highest level of cleanliness must be maintained at the workplace.

8.2.1 Respiratory protection
No additional recommendations.

8.2.2 Skin protection / Hand protection
Yes, gloves according EN 374 (permeation time >30 min - level 2), consist of PVC (f.ex. from Ansell or KCL). Use for short times chemical resistant latex or nitril gloves with code EN 374-3 level 1.

8.2.3 Eye / Face Protection
Yes, safety glasses according EN 166 with integrated side shields or wrap-around protection or face protection.

8.2.4 Skin protection
Recommended to avoid clothing damage, and to avoid contamination with these hazards.

8.2.5 Personal hygiene
Eating, drinking, smoking, taking snuff and storage of food in work areas and at outdoor workplaces is prohibited. Avoid contact with the skin, eyes and clothing. Rinse any clothing on which the substance has been spilled, and soak it in water. Wash hands thoroughly with soap and water when stopping work and before eating, and then apply protective skin cream.

8.2.6 Thermal hazards
no data available

8.3 Limitation and monitoring of environmental exposure

Do not release product into environment.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

50 mL Acetic acid 50%

a) State of aggregation:	liquid
b) Colour:	colourless
c) Odor:	acetic
d) Melting point:	-84 °C
e) Boiling point:	77 °C
f) Flammability:	no data available
g) Explosive limits (lower / upper):	2.1-11.5 Vol%
h) Flash point:	>100 °C
i) Flashing temperature:	460 °C
j) Decomposition temperature:	no data available
k) pH value:	2-3
l) Kinematic viscosity:	no data available
m) Solubility in water:	0-8 %
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	92 hPa
p) Specific gravity:	1,06 g/cm³
q) Relative vapour density $_{(air=1)}$:	3,04
r) Particle size:	no data available

50 mL Hydrochloric acid 18%

a) State of aggregation:	liquid
b) Colour:	colourless
c) Odor:	penetrative
d) Melting point:	no data available
e) Boiling point:	no data available
f) Flammability:	no data available
g) Explosive limits (lower / upper):	no data available

h) Flash point:	no data available
i) Flashing temperature:	no data available
j) Decomposition temperature:	no data available
k) pH value:	0-1
l) Kinematic viscosity:	no data available
m) Solubility in water:	no data available
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	no data available
p) Specific gravity:	1,09 g/cm³
q) Relative vapour density $_{(air=1)}$:	no data available
r) Particle size:	no data available

8 mL Amino acid test mixture

a) State of aggregation:	liquid
b) Colour:	
c) Odor:	
d) Melting point:	no data available
e) Boiling point:	no data available
f) Flammability:	no data available
g) Explosive limits (lower / upper):	no data available
h) Flash point:	no data available
i) Flashing temperature:	no data available
j) Decomposition temperature:	no data available
k) pH value:	no data available
l) Kinematic viscosity:	no data available
m) Solubility in water:	no data available
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	no data available
p) Specific gravity:	no data available
q) Relative vapour density $_{(air=1)}$:	no data available
r) Particle size:	no data available

8 ml TLC Reference Solution (A) Arginine

a) State of aggregation:	liquid
b) Colour:	
c) Odor:	
d) Melting point:	no data available
e) Boiling point:	no data available
f) Flammability:	no data available
g) Explosive limits (lower / upper):	no data available
h) Flash point:	no data available
i) Flashing temperature:	no data available
j) Decomposition temperature:	no data available
k) pH value:	no data available
l) Kinematic viscosity:	no data available
m) Solubility in water:	no data available
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	no data available
p) Specific gravity:	no data available
q) Relative vapour density $_{(air=1)}$:	no data available
r) Particle size:	no data available

8 ml TLC Reference Solution (B) Tryptophane

a) State of aggregation:	liquid
b) Colour:	
c) Odor:	
d) Melting point:	no data available
e) Boiling point:	no data available
f) Flammability:	no data available
g) Explosive limits (lower / upper):	no data available
h) Flash point:	no data available
i) Flashing temperature:	no data available
j) Decomposition temperature:	no data available
k) pH value:	no data available

l) Kinematic viscosity:	no data available
m) Solubility in water:	no data available
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	no data available
p) Specific gravity:	no data available
q) Relative vapour density $_{(air=1)}$:	no data available
r) Particle size:	no data available

100 mL Ninhydrin spray reagent

a) State of aggregation:	liquid
b) Colour:	red
c) Odor:	alcoholic
d) Melting point:	-114 °C
e) Boiling point:	78 °C
f) Flammability:	no data available
g) Explosive limits (lower / upper):	3.2-15 Vol%
h) Flash point:	12 °C
i) Flashing temperature:	425 °C
j) Decomposition temperature:	no data available
k) pH value:	7
l) Kinematic viscosity:	no data available
m) Solubility in water:	0-100 %
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	59 hPa
p) Specific gravity:	0,79-0,86 g/cm³
q) Relative vapour density $_{(air=1)}$:	1,59
r) Particle size:	no data available

100 mL Rubeanic acid spray reagent

a) State of aggregation:	liquid
b) Colour:	yellow
c) Odor:	alcoholic
d) Melting point:	-114 °C
e) Boiling point:	78 °C
f) Flammability:	no data available
g) Explosive limits (lower / upper):	3.2-15 Vol%
h) Flash point:	12 °C
i) Flashing temperature:	425 °C
j) Decomposition temperature:	no data available
k) pH value:	7
l) Kinematic viscosity:	no data available
m) Solubility in water:	0-100 %
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	59 hPa
p) Specific gravity:	0,79-0,86 g/cm³
q) Relative vapour density $_{(air=1)}$:	1,59
r) Particle size:	no data available

8 mL Cation test mixture (heavy metals)

a) State of aggregation:	liquid
b) Colour:	colored
c) Odor:	odorless
d) Melting point:	no data available
e) Boiling point:	no data available
f) Flammability:	no data available
g) Explosive limits (lower / upper):	no data available
h) Flash point:	no data available
i) Flashing temperature:	no data available
j) Decomposition temperature:	no data available
k) pH value:	no data available
l) Kinematic viscosity:	no data available
m) Solubility in water:	no data available
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	no data available

p) Specific gravity:	no data available
q) Relative vapour density $_{(air=1)}$:	no data available
r) Particle size:	no data available

8 mL Reference solution Manganese

a) State of aggregation:	liquid
b) Colour:	colourless
c) Odor:	odorless
d) Melting point:	no data available
e) Boiling point:	no data available
f) Flammability:	no data available
g) Explosive limits (lower / upper):	no data available
h) Flash point:	no data available
i) Flashing temperature:	no data available
j) Decomposition temperature:	no data available
k) pH value:	no data available
l) Kinematic viscosity:	no data available
m) Solubility in water:	no data available
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	no data available
p) Specific gravity:	no data available
q) Relative vapour density $_{(air=1)}$:	no data available
r) Particle size:	no data available

100 mL Ammonia solution 25%

a) State of aggregation:	liquid
b) Colour:	colourless
c) Odor:	aminic
d) Melting point:	< -57.5 °C
e) Boiling point:	37.7 (25%) °C
f) Flammability:	no data available
g) Explosive limits (lower / upper):	15-28 Vol%
h) Flash point:	no data available
i) Flashing temperature:	no data available
j) Decomposition temperature:	no data available
k) pH value:	> 11,5
l) Kinematic viscosity:	no data available
m) Solubility in water:	0-100 %
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	> 500 hPa
p) Specific gravity:	0,88 g/cm³
q) Relative vapour density $_{(air=1)}$:	no data available
r) Particle size:	no data available

8 mL Reference solution Copper

a) State of aggregation:	liquid
b) Colour:	blue
c) Odor:	odorless
d) Melting point:	no data available
e) Boiling point:	no data available
f) Flammability:	no data available
g) Explosive limits (lower / upper):	no data available
h) Flash point:	no data available
i) Flashing temperature:	no data available
j) Decomposition temperature:	no data available
k) pH value:	no data available
l) Kinematic viscosity:	no data available
m) Solubility in water:	no data available
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	no data available
p) Specific gravity:	no data available
q) Relative vapour density $_{(air=1)}$:	no data available
r) Particle size:	no data available

100 mL Acetone

a) State of aggregation:	liquid
b) Colour:	colourless
c) Odor:	like acetone
d) Melting point:	-95 °C
e) Boiling point:	56 °C
f) Flammability:	no data available
g) Explosive limits (lower / upper):	2.5-13 Vol%
h) Flash point:	-20 °C
i) Flashing temperature:	540 °C
j) Decomposition temperature:	no data available
k) pH value:	5-6
l) Kinematic viscosity:	no data available
m) Solubility in water:	0-100 %
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	233 hPa
p) Specific gravity:	0,79 g/cm³
q) Relative vapour density $_{(air=1)}$:	2,01
r) Particle size:	no data available

100 mL n-Butanol

a) State of aggregation:	liquid
b) Colour:	colourless
c) Odor:	fusty, mouldy
d) Melting point:	-89 °C
e) Boiling point:	117 °C
f) Flammability:	no data available
g) Explosive limits (lower / upper):	1.4-11 Vol%
h) Flash point:	34 °C
i) Flashing temperature:	325 °C
j) Decomposition temperature:	no data available
k) pH value:	7
l) Kinematic viscosity:	no data available
m) Solubility in water:	0-8 %
n) Dispersion coefficient $_{(o/w)}$:	no data available
o) Vapour pressure (20°C):	6.3 hPa
p) Specific gravity:	0,81 g/cm³
q) Relative vapour density $_{(air=1)}$:	2,55
r) Particle size:	no data available

9.2 Other information

No data is available for the other parameters for the mixtures, since no registration and no chemical safety report is required.
Properties relevant to substance groups
Substances are highly volatile and form flammable gas-air mixtures. Substances are highly corrosive.

SECTION 10: Stability and reactivity

10.1 Reactivity

no further data available.

10.2 Chemical stability

no known instability.

10.3 Possibility of hazardous reactions

Can react violently with organic material. No further data available.

10.4 Conditions to avoid

No more required.

10.5 Incompatible materials

no additional data available

10.6 Hazardous decomposition products

In the original package all parts/all reagents are safety and separated stored. Decompositions are not observed during the expiration period under recommended conditions.

SECTION 11: Toxicological information

11.1 Information on the hazard classes according regulation (EC) 1272/2008

Following information is valid for pure substances. Quantitative data on the toxicity of this product are not available.

50 mL Acetic acid 50%

Chemical: *acetic acid* CAS No.: 64-19-7
TSCA Inventory: listed California Proposition 65 List: not listed
Exposure Routes: inhalation, skin and/or eye contact
Target Organs: Eyes, skin, respiratory system, teeth
Symptoms: irritation eyes, skin, nose, throat; eye, skin burns; skin sensitization; dental erosion; black skin, hyperkeratosis; conjunctivitis, lacrimation (di
Australia NICNAS: not listed Canada CEPA 1999: DSL Yes
Japan CSCL/PRTR: not listed, Japan PDSCL: not listed
Japan ISHL: listed ≥1,0%/≥1,0%, Article 57-2 (SDS required)
South Korea TCCA: not listed
Korea Exist.Chem.Inventory: KE-00013
LD50 $_{orl\ rat}$: 3310 mg/kg
LD50 $_{orl\ mus}$: 4960 mg/kg

50 mL Hydrochloric acid 18%

Chemical: *hydrochloric acid* CAS No.: 7647-01-0
TSCA Inventory: listed California Proposition 65 List: not listed
Exposure Routes: inhalation, ingestion (solution), skin and/or eye contact
Target Organs: Eyes, skin, respiratory system
Symptoms: irritation nose, throat, larynx; cough, choking; dermatitis; solution: eye, skin burns; liquid: frostbite; in animals: laryngeal spasm; pulmonary ede
Australia NICNAS: not listed Canada CEPA 1999: DSL Yes
Japan CSCL/PRTR: not listed, Japan PDSCL: Deleterious Substance
Japan ISHL: listed ≥0,2%/≥0,1%, Article 57-2 (SDS required)
South Korea TCCA: Accident Precaution Chemical Yes
Korea Exist.Chem.Inventory: KE-20189, >10% Toxic 97-1-203, Acc. Precaution Chem.
LD50 $_{orl\ rat}$: 900 mg/kg
Acute Effects: Cause after inhalation of vapours/dust, impairments of health when ingested in small quantities.

8 mL Amino acid test mixture

Chemical: *water* CAS No.: 7732-18-5
TSCA Inventory: listed
Korea Exist.Chem.Inventory: KE-35400
LD50 $_{orl\ rat}$: > 90000 mg/kg

8 ml TLC Reference Solution (A) Arginine

Chemical: *water* CAS No.: 7732-18-5
TSCA Inventory: listed
Korea Exist.Chem.Inventory: KE-35400
LD50 $_{orl\ rat}$: > 90000 mg/kg

8 ml TLC Reference Solution (B) Tryptophane

Chemical: *water* CAS No.: 7732-18-5
TSCA Inventory: listed
Korea Exist.Chem.Inventory: KE-35400
LD50 $_{orl\ rat}$: > 90000 mg/kg

100 mL Ninhydrin spray reagent

Chemical: *ethanol* CAS No.: 64-17-5
TSCA Inventory: listed California Proposition 65 List: not listed
ACGIH: 1000 ppm
Exposure Routes: inhalation, ingestion, skin and/or eye contact
Target Organs: Eyes, skin, respiratory system, central nervous system, liver, blood, reproductive system
Symptoms: irritation eyes, skin, nose; headache, drowsiness, lassitude (weakness, exhaustion), narcosis; cough; liver damage; anemia; reproductive, teratogenic
Australia NICNAS: not listed Canada CEPA 1999: DSL yes
Japan CSCL/PRTR: not listed, Japan PDSCL: not listed
Japan ISHL: listed ≥0,1%/≥0,1%, Article 57-2 (SDS required)
South Korea TCCA: not listed
Korea Exist.Chem.Inventory: KE-13217
LD50 orl rat : 6200 mg/kg
LC_Low ihl gpg : 21,900 mg/L
LC_Low orl hmn : 1400 mg/kg
LC50 ihl mus : 123,4 mg/L/4H
LC50 ihl rat : 115,9-133,8 mg/L/4H
LD50 orl mus : 3450 mg/kg

TRGS 905 (DE): K5, M5, R $_F$ C

Chemical: *ninhydrin* CAS No.: 485-47-2
TSCA Inventory: listed
Korea Exist.Chem.Inventory: KE-10839
LD50 orl rat : 600 mg/kg
LC_Low orl rat : 250 mg/kg

100 mL Rubeanic acid spray reagent

Chemical: *ethanol* CAS No.: 64-17-5
TSCA Inventory: listed California Proposition 65 List: not listed
ACGIH: 1000 ppm
Exposure Routes: inhalation, ingestion, skin and/or eye contact
Target Organs: Eyes, skin, respiratory system, central nervous system, liver, blood, reproductive system
Symptoms: irritation eyes, skin, nose; headache, drowsiness, lassitude (weakness, exhaustion), narcosis; cough; liver damage; anemia; reproductive, teratogenic
Australia NICNAS: not listed Canada CEPA 1999: DSL yes
Japan CSCL/PRTR: not listed, Japan PDSCL: not listed
Japan ISHL: listed ≥0,1%/≥0,1%, Article 57-2 (SDS required)
South Korea TCCA: not listed
Korea Exist.Chem.Inventory: KE-13217
LD50 orl rat : 6200 mg/kg
LC_Low ihl gpg : 21,900 mg/L
LC_Low orl hmn : 1400 mg/kg
LC50 ihl mus : 123,4 mg/L/4H
LC50 ihl rat : 115,9-133,8 mg/L/4H
LD50 orl mus : 3450 mg/kg

TRGS 905 (DE): K5, M5, R $_F$ C

Chemical: *rubeanic acid* CAS No.: 79-40-3
TSCA Inventory: listed
Korea Exist.Chem.Inventory: not listed
LD50 orl rat : 500 mg/kg

8 mL Cation test mixture (heavy metals)

Chemical: *manganese(II) sulfate (monohydrate)* CAS No.: 10034-96-5
TSCA Inventory: listed (CAS 7785-87-7)
Exposure Routes: inhalation, ingestion
Symptoms: Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like
Japan CSCL/PRTR: PRTR: ≥1,0%Mn class I, Japan PDSCL: not listed
Japan ISHL: listed ≥1,0%/≥0,1%
LD50 orl rat : 2150 mg/kg

Chemical: *copper(II) sulfate (pentahydrate)* CAS No.: 7758-98-7
TSCA Inventory: listed
Japan ISHL: listed ≥1,0%/≥0,1%
LD50 orl rat : 300 mg/kg
LC_Low orl hmn : 50 mg/kg

TRGS 905 (DE): R F C

8 mL Reference solution Manganese
Chemical: *manganese(II) sulfate (monohydrate)* CAS No.: 10034-96-5
TSCA Inventory: listed (CAS 7785-87-7)
Exposure Routes: inhalation, ingestion
Symptoms: Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like
Japan CSCL/PRTR: PRTR: ≥1,0%Mn class I, Japan PDSCL: not listed
Japan ISHL: listed ≥1,0%/≥0,1%
LD50 orl rat : 2150 mg/kg

100 mL Ammonia solution 25%
Chemical: *ammonia solution* CAS No.: 1336-21-6
TSCA Inventory: listed California Proposition 65 List: not listed
Exposure Routes: inhalation, ingestion (solution), skin and/or eye contact (solution/liquid)
Target Organs: Eyes, skin, respiratory system
Symptoms: irritation eyes, nose, throat; dyspnea (breathing difficulty), wheezing, chest pain; pulmonary edema; pink frothy sputum; skin burns, vesiculation; l
Australia NICNAS: not listed Canada CEPA 1999: DSL yes, Toxic Substances (Schedule 1) Yes (Item 53.)
Japan CSCL/PRTR: not listed, Japan PDSCL: Deleterious Substance
Japan ISHL: listed ≥0,2%/≥0,1%, Article 57-2 (SDS required)
South Korea TCCA: not listed
Korea Exist.Chem.Inventory: KE-01688, >10% Toxic 97-1-184
LD50 orl rat : 350 mg/kg
LC_Low ihl hmn : 5,000 mg/L
LC50 ihl rat : 2000 ppm/4H
Acute Effects: Cause after inhalation of vapours/dust, impairments of health when ingested in small quantities.

8 mL Reference solution Copper
Chemical: *copper(II) sulfate (pentahydrate)* CAS No.: 7758-98-7
TSCA Inventory: listed
Japan ISHL: listed ≥1,0%/≥0,1%
LD50 orl rat : 300 mg/kg
LC_Low orl hmn : 50 mg/kg

TRGS 905 (DE): R F C

100 mL Acetone
Chemical: *acetone* CAS No.: 67-64-1
TSCA Inventory: listed California Proposition 65 List: not listed
ACGIH: 750 ppm
Exposure Routes: inhalation, ingestion, skin and/or eye contact
Target Organs: Eyes, skin, respiratory system, central nervous system
Symptoms: irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis
Australia NICNAS: not listed Canada CEPA 1999: DSL yes
Japan CSCL/PRTR: [PAC] Yes, Japan PDSCL: not listed
Japan ISHL: listed ≥1,0%/≥0,1%, Article 57-1+2 (Labelling&SDS required)
South Korea TCCA: not listed
Korea Exist.Chem.Inventory: KE-29367
LD50 orl rat : 5800 mg/kg
LC50 ihl rat : 50,1 mg/L/8H

100 mL n-Butanol
Chemical: *1-butanol* CAS No.: 71-36-3
TSCA Inventory: listed California Proposition 65 List: not listed
ACGIH: 152 ppm
Exposure Routes: inhalation, skin absorption, ingestion, skin and/or eye contact

Target Organs: Eyes, skin, respiratory system, central nervous system
Symptoms: irritation eyes, nose, throat; headache, dizziness, drowsiness; corneal inflammation, blurred vision, lacrimation (discharge of tears), photophobia (
Australia NICNAS: not listed Canada CEPA 1999: DSL yes
Japan CSCL/PRTR: PAC yes, Japan PDSCL: not listed
Japan ISHL: listed ≥1,0%/≥0,1%,, Article 57-1+2 (Labelling&SDS required)
South Korea TCCA: not listed
Korea Exist.Chem.Inventory: KE-03867
LD50 $_{orl\ rat}$: 790 mg/kg
LC_Low $_{ihl\ hmn}$: 0,08 mg/L
Acute Effects: Cause after oral intake, inhalation of vapours/dust, impairments of health when ingested in small quantities.
TRGS 905 (DE): R $_{F}$ C

11.2 Other hazards

Possible endocrine disrupting effects
no data available

Other information
no additional data available

SECTION 12: Ecological information

12.1 Toxicity

Following information is valid for pure substances.

50 mL Acetic acid 50%
Chemical: *acetic acid* CAS No.: 64-19-7
Avoid contact of substance/mixture to environment.
PNEC $_{(fresh\ water)}$: 3.058 mg/L
PNEC = Predicted No Effected Concentration
LC50 $_{fish/96h}$: [4d] 301-1000 mg/L
EC50 $_{daphnia/48h}$: 301-1000 mg/L
IC50 $_{scenedesmus\ quadricauda/72h}$: 301-1000 mg/L
Water hazard class (DE): 1 WGK No.: 0093
Dispersion coefficient $_{(o/w)}$: -0,17
Storage class (VCI): 8 B

50 mL Hydrochloric acid 18%
Chemical: *hydrochloric acid* CAS No.: 7647-01-0
PNEC $_{(fresh\ water)}$: 36 µg/L
PNEC = Predicted No Effected Concentration
LC50 $_{fish/96h}$: 24.6 mg/L
EC50 $_{daphnia/48h}$: 0.492 mg/L
EC50 $_{pseudokirchneriella\ subcapitata/72h}$: 0.78 mg/L
Water hazard class (DE): 1 WGK No.: 0238
Storage class (VCI): 8 B

8 mL Amino acid test mixture
Chemical: *water* CAS No.: 7732-18-5

8 ml TLC Reference Solution (A) Arginine
Chemical: *water* CAS No.: 7732-18-5

8 ml TLC Reference Solution (B) Tryptophane
Chemical: *water* CAS No.: 7732-18-5

100 mL Ninhydrin spray reagent
Chemical: *ethanol* CAS No.: 64-17-5
PNEC $_{(fresh\ water)}$: 0.96 mg/L
PNEC = Predicted No Effected Concentration
LC50 $_{daphnia\ magna/48h}$: >100 mg/L
LC50 $_{pimephales\ promelas/96h}$: 13400 - 15100 mg/L
LC50 $_{leuciscus\ idus/96h}$: [48h] 8140 mg/L
LC50 $_{fish/96h}$: 13 g/L
EC50 $_{daphnia/48h}$: 9.3-14.2 g/L

IC50 scenedesmus quadricauda/72h : [7d] 5000 mg/L
EC10 pseudomonas putita/16h : [EC5] 6500 mg/L
Water hazard class (DE): 1 WGK No.: 0096
Dispersion coefficient (o/w) : -0,31
Storage class (VCI): 3

Chemical: *ninhydrin* CAS No.: 485-47-2
Water hazard class (DE): 2
Storage class (VCI): 12

100 mL Rubeanic acid spray reagent
Chemical: *ethanol* CAS No.: 64-17-5
PNEC (fresh water) : 0.96 mg/L
PNEC = Predicted No Effected Concentration
LC50 daphnia magna/48h : >100 mg/L
LC50 pimephales promelas/96h : 13400 - 15100 mg/L
LC50 leuciscus idus/96h : [48h] 8140 mg/L
LC50 fish/96h : 13 g/L
EC50 daphnia/48h : 9.3-14.2 g/L
IC50 scenedesmus quadricauda/72h : [7d] 5000 mg/L
EC10 pseudomonas putita/16h : [EC5] 6500 mg/L
Water hazard class (DE): 1 WGK No.: 0096
Dispersion coefficient (o/w) : -0,31
Storage class (VCI): 3

Chemical: *rubeanic acid* CAS No.: 79-40-3
Water hazard class (DE): 2
Storage class (VCI): 12

8 mL Cation test mixture (heavy metals)
Chemical: *manganese(II) sulfate (monohydrate)* CAS No.: 10034-96-5
Water hazard class (DE): 1
Storage class (VCI): 12-13

Chemical: *copper(II) sulfate (pentahydrate)* CAS No.: 7758-98-7
LC50 pimephales promelas/96h : 0.1-2.5 mg/L
EC50 daphnia/48h : 0.82 mg/L
Water hazard class (DE): 2 WGK No.: 0141
Storage class (VCI): 12

8 mL Reference solution Manganese
Chemical: *manganese(II) sulfate (monohydrate)* CAS No.: 10034-96-5
Water hazard class (DE): 1
Storage class (VCI): 12-13

100 mL Ammonia solution 25%
Chemical: *ammonia solution* CAS No.: 1336-21-6
Very toxic to aquatic life. Avoid contact of substance/mixture to environment.
Environmental hazards must not be labelled with H and P phrases until 125 mL (EU 1272/2008 Annex I - 1.5.2).
PNEC (fresh water) : 0.0011 mg/L
PNEC = Predicted No Effected Concentration
LC50 fish/96h : 0,89 mg/L
EC50 daphnia/48h : 101 mg/L
Water hazard class (DE): 2 WGK No.: 0211
Storage class (VCI): 8 B

8 mL Reference solution Copper
Chemical: *copper(II) sulfate (pentahydrate)* CAS No.: 7758-98-7
LC50 pimephales promelas/96h : 0.1-2.5 mg/L
EC50 daphnia/48h : 0.82 mg/L
Water hazard class (DE): 2 WGK No.: 0141
Storage class (VCI): 12

100 mL Acetone

Chemical: *acetone* CAS No.: 67-64-1

PNEC (fresh water) :	10.6 mg/L
PNEC = Predicted No Effected Concentration	
LC50 daphnia magna/48h :	[48h] 8.8 g/L
LC50 fish/96h :	[4d] 5540 mg/L
EC50 daphnia/48h :	2212 mg/L
IC50 scenedesmus quadricauda/72h :	IC5: 7500 mg/L
EC10 pseudomonas putita/16h :	[30 min] 61,15 g/L
Water hazard class (DE):	1 WGK No.: 0006
Dispersion coefficient (o/w) :	-0,24
Storage class (VCI):	3

100 mL n-Butanol

Chemical: *1-butanol* CAS No.: 71-36-3

PNEC (fresh water) :	0,082 mg/L
PNEC = Predicted No Effected Concentration	
LC50 leuciscus idus/96h :	1200-1700 mg/L
EC50 daphnia/48h :	1983 mg/L
IC50 scenedesmus quadricauda/72h :	>500 mg/L
EC10 pseudomonas putita/16h :	2250 mg/L
Water hazard class (DE):	1 WGK No.: 0039
Dispersion coefficient (o/w) :	0,88
Storage class (VCI):	3

12.2 Persistence and degradability

not necessary

12.3 Bioaccumulative potential

not necessary

12.4 Mobility in soil

not necessary

12.5 Results of PBT and vPvB 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

12.6 Endocrine disrupting properties

no data available

12.7 Other adverse effects

no additional data available

SECTION 13: Disposal considerations

Please observe local regulations for collection and disposal of hazardous waste and contact waste disposal company, where you will obtain information on laboratory waste disposal (waste code number 16 05 06).

13.1 Waste treatment methods

Normally it is possible to empty small amounts (diluted!) into drains. Empty containers of corrosive reagents prior to disposal, rinse with water.

SECTION 14: Transport information

14.1. UN number: 3316
14.2. UN proper shipping name: Chemical Kit
14.3. Class: 9 14.4. Packing group: II

Road transport ADR

Classification code:	M11	Tunnel restriction code:	E
Limited Quantity:	acc. ADR 3.3.1/251: see LQ in Alternative declaration for transportation		

Air transport ICAO

PAX:	960	max. weight PAX:	10 KG
CAO:	960	max. weight CAO:	10 KG

Maritime transport IMDG

EmS:	F-A, S-P	Storage category:	A

Or use **Alternative declaration for transportation:**

14.1 UN number: 1993 **14.2 UN proper shipping name: Flammable liquid, n.o.s. (acetone, ethanol mixture)**
14.3 Class: 3 **14.4 Packing group: II**

Road transport ADR

Classification code:	F1		
Limited Quantity:	1 L	Tunnel restriction code:	E
Excepted Quantity:	E 2	Special instructions:	640C

Air transport ICAO

Limited Quantity:	LQ 4		
Excepted Quantity:	E 2		
PAX:	353	max. weight PAX:	5 L
CAO:	364	max. weight CAO:	60 L

Maritime transport IMDG

EmS:	F-E, S-E	Storage category:	B

14.1 UN number: 3264 **14.2 UN proper shipping name: Corrosive liquid, acidic, inorganic, n.o.s. (hydrochloric acid solution)**
14.3 Class: 8 **14.4 Packing group: II**

Road transport ADR

Classification code:	C1		
Limited Quantity:	1 L	Tunnel restriction code:	E
Excepted Quantity:	E 2		

Air transport ICAO

Limited Quantity:	LQ 22		
Excepted Quantity:	E 2		
PAX:	851	max. weight PAX:	1 L
CAO:	855	max. weight CAO:	30 L

Maritime transport IMDG

EmS:	F-A, S-B	Storage category:	B

14.1 UN number: 3266 **14.2 UN proper shipping name: Corrosive liquid, basic, inorganic, n.o.s. (ammonia solution)**
14.3 Class: 8 **14.4 Packing group: II**

Road transport ADR

Classification code:	C5		
Limited Quantity:	1 L	Tunnel restriction code:	E
Excepted Quantity:	E 2		

Air transport ICAO

Limited Quantity:	LQ22		
Excepted Quantity:	E 2		
PAX:	851	max. weight PAX:	1 L
CAO:	855	max. weight CAO:	30 L

Maritime transport IMDG

EmS:	F-A, S-B	Storage category:	B

14.5 Environmental hazards

none, contains only small quantities of hazardous substances

14.6 Special precautions for user

not necessary

14.7 Carriage in bulk by sea in accordance with IMO instruments

Not applicable.

SECTION 15: Regulatory information

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

Dangerous Substances Protection Act (DE: Chemikaliengesetz - ChemG), Aug 2013, Stand: Okt 2020
Ordinance on protection against dangerous substances (E: Gefahrstoffverordnung - GefStoffV), Nov 2010, Stand: Mrz 2017
TRGS 201, Classification and labeling of activities involving hazardous substances, Feb 2017
TRGS 220, National aspects when preparing safety data sheets, Jan 2017
TRGS 400, Risk assessment for activities involving hazardous substances, Jul 2017
TRGS 401, Skin contact hazard - identification, assessment, action, Jun 2008, status: Feb 2011
BekGS 408, Application of the GefStoffV and the TRGS with the entry into force of the CLP regulation, December 2009, status: Jan 2012
TRGS 500, Protective measures, Mai 2008

TRGS 510, Storage of hazardous substances in portable containers from March 2013, status: Oct 2015
Chapter 4, Measures when storing hazardous substances up to 50 kg (small quantity regulation)
Wasserhaushaltsgesetz - WHG, Section 3 Handling substances hazardous to water, Jul 2009, status: Aug 2016
MN leaflet/instructions for use, also at www.mn-net.com
If necessary, observe other country-specific regulations.

15.2 Chemical safety assessment

not necessary for these small amounts

SECTION 16: Other information

16.1 Changes compared to the last version

Between versions 2.2.2.10 and 2.2.2.2 following changes were applied: - 8 substance data corrected

16.2 List of H and P phrases

16.2.1 List of relevant H phrases

H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
EUH066	Repeated exposure may cause skin dryness or cracking.

16.2.2 List of relevant P phrases

P260sh	Do not breathe dust/vapours.
P280sh	Wear protective gloves/eye protection.
P303+361+353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P305+351+338	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 POISON CENTER/doctor.

16.3 Recommended restriction on use

Only for professional user.
Look about employee restrictions for young people (f. ex. 94/33/EC or DE § 22 JArbSchG)!
Look about employee restrictions for pregnant women and nursing women (f.ex. 92/85/EEC or for DE §§ 11-13 MuSchG 2017)!
An individual package of this product or test kit has a moderate hazardous potential.

16.4 Sources of key data

KÜHN, BIRETT, Leaflets on hazardous materials, 2021
Directive 1999/92/EG Minimum requirements to improve the safety and health protection of workers at risk from potentially explosive atmospheres
SUVA .CH, limit values in the air at work 2009, revised on 01/2009
Regulation 790/2009/EU, adaptation of Regulation 1272/2008/EU to technical and scientific progress (1st ATP)
Regulation 453/2010/EU, adaptation of the REACH regulation 1907/2006/EG
Regulation 487/2013/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (4th ATP)
Regulation 1221/2015/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (7th ATP)
Regulation 776/2017/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (10th ATP)

Regulation 669/2018/EU, adaptation of Regulation 1272/2008/EC to technical and scientific progressText (11th ATP)
Regulation 1480/2018/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (13th ATP)
Regulation 521/2019/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (12th ATP)
TRGS 900, German rules of technology on limit values in the air at work, as of 03/2019
Regulation 217/2020/EU, adaptation of Annex VI, Part 3, of Regulation 1272/2008/EC to technical and scientific progress (14th ATP)
Regulation 878/2020/EU, adaptation of Annex II of the REACH regulation 1907/2006/EG
Regulation 1182/2020/EU, adaptation of Annex VI, Part 3, of Regulation 1272/2008/EC to technical and scientific progress (15th ATP)
Regulation 643/2021/EU, adaptation of Annex VI, Part 1, of Regulation 1272/2008/EC to technical and scientific progress (16th ATP)
Regulation 849/2021/EU, adaptation of Annex VI, Part 3, of Regulation 1272/2008/EC to technical and scientific progress (17th ATP)

revisions/updates

Reason for revision: *2014-02 Corrected structure of the sections according to Regulation 453/2010/EU, if necessary*
2014-04 adjustment according Regulation 487/2013/EU

2016-03 adjustment according Regulation 1221/2015/EU
2017–08 adjustment according the Ordinance on Ethanol Denaturation 2016/1867/EU
2017-11 adjustment according the ECHA registration dossier
2022-11 adjustment according Regulation 878/2020/EU

16.5 Further information

MACHEREY-NAGEL GmbH & Co. KG provides the information contained herein in good faith being up-to-date of own realizations at revision time. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgement in determining its appropriateness for a particular purpose.
MACHEREY-NAGEL GmbH & Co. KG makes NO REPRESENTATIONS or WARRANTIES, either expressed or implied, including without limitation any warranties of merchantability, fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Accordingly MACHEREY-NAGEL GmbH & Co. KG will not be responsible for damages resulting from use of or reliance upon this information. See terms and conditions at the end of our price lists for additional information.

16.6 Legend / Abbreviations

acc:	according
ADR:	Convention concerning the International Carriage of Dangerous Goods by Road
Act:	acute
BAT:	biological workplace tolerance value
CAO:	Cargo Aircraft Only
Carc:	carcinogen
CAS:	Chemical Abstracts Service
CLP:	Classification, Labelling and Packaging regulation
CMR:	carcinogen, mutagen, reproduction toxic
Corr:	corrosive
COD:	chemical oxigen demand
CSCL:	Chemical Substance Control Law (Jp)
Dam:	damage
DNEL:	Derived No-Effect Level (for workers)
derm:	dermal
dog:	dog
EC10:	Concentration causing a toxic effect in 10% of the test organisms
EC:	European Community
EC-Nr:	Substance number of the EC substance inventory
EmS:	Guide to accident management measures on ships
EU:	European Union
fish:	fish (not spezified)
GHS:	Global Harmonized System of Classification and Labeling of Chemicals
gpg:	guinea pig
ICAO:	International Civil Aviation Organization
ihl:	inhaled
IMDG:	International Maritime Dangerous Goods Code
intrav:	intravenous
ipt:	intraperitonaeal
ISHL:	Industrial Safety and Health Law (Jp)
LC50:	letale concentration 50%
LD50:	letale dosis 50%
leuciscus idus:	fisch, ide, orfe
MAK:	maximum workplace concentration
Met:	Metall
mus:	mouse
Muta:	mutagen
NIOSH:	National Institute for Occupational Safety and Health (US)
NRD:	Non-rapidly degradable
onchorhynchus mykiss:	fish, rainbow trout
orl:	oral
OSHA:	Occupational Safety and Health Administration
PAX:	transport on passenger planes allowed
PBT:	persistent, bioaccumulating, toxic substance
pH:	pH value
pimephales promelas:	fish, fathead minnow
PNEC:	Predicted No Effected Concentration
PROC 15:	Process category 'for laboratory use'
PRTR:	Law for PRTR and Promotion of Chemical Management (Jp)
PVC:	polyvinyl chloride
quail:	bird, quail
rat:	rat

rbt:	rabbit
RD:	rapidly degradable
RE:	repeated
REACh:	Registration, Evaluation, Authorisation and Restriction of Chemicals
REF:	item number, reference number
Reg.No.:	rRegistration number
Repr:	harmful to reproduction
Resp:	respiratory
RIP:	REACH Implementations Projects
scu:	sub cutan
SDS:	safety data sheet
Sens:	sensitisation
STEL:	short term exposure limit
STOT:	Specific Target Organ Toxicity
SVHC:	Substance of Very High Concern
t/a:	tons per year
TCCA:	Toxic Chemicals Control Act (S. Korea)
Tox:	toxic
TSCA:	The Toxic Substances Control Act (US)
TWA:	time weighted average
TRGS:	technical regulations (DE)
vPvB:	very persistent, very bioaccumulating substance

16.7 Training advice

Regular safety training. Multiple safety training of staffs about danger and protection by using hazards in working area. Additionally training and introduction of staffs for using these products.