

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Commercial Product Name
KEMIRA ALS-LC

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

Use of the Substance/Mixture

ES 2., Industrial use, Formulation and distribution

ES 3., Industrial use, Use of substance in synthesis as a process chemical and as an intermediate.

ES 4., Industrial use, Professional use, Spraying formulations.

Exposure scenario available on request.

ES 5., Industrial use, Professional use, Non-spraying formulations.

Exposure scenario available on request.

ES 6., Industrial use, Professional use, Water treatment chemical, Products such as ph-regulators, flocculants, pre-cipitants, neutralization agents

ES 7., Industrial use, Professional use, Laboratory chemical

Recommended restrictions on use

There are no uses advised against.

1.3 Details of the supplier of the safety data sheet

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P.O. Box 33000101 HELSINKI FINLAND
Telephone+358108611, Telefax. +358108621124
ProductSafety.FI.Helsinki@kemira.com

1.4 Emergency telephone number

Carechem 24 International: +44 (0) 1235 239 670

Centro de Informação Antivenenos (Portugal): +351 808250143 (24 h.)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EU) 1272/2008(CLP)

Serious eye damage/eye irritation; Category 1; Causes serious eye damage.

Corrosive to metals; Category 1; May be corrosive to metals.

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Irritant; Risk of serious damage to eyes.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)



Hazard pictograms
Signal word

:
 : Danger

Hazard statements

: H318 Causes serious eye damage.
 H290 May be corrosive to metals.

Precautionary statements

: **Prevention:**
 P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
 P264 Wash hands thoroughly after handling.
 P280 Wear eye protection/ face protection.
Response:
 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 POISON CENTER or doctor/ physician.

Hazardous components which must be listed on the label:

10043-01-3 Aluminium sulphate

Further information

: The product is classified and labelled in accordance with EC directives or respective national laws.

2.3 Other hazards

Inhalation; Possible risk for irritation of respiratory organs and skin.

Potential environmental effects; May lower the pH of water and thus be harmful to aquatic organisms.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Chemical nature of the mixture Aluminium sulphate solution.

CAS/EU number/REACH Registration Number	Chemical name of the substance	Concentration	Classification according to Regulation (EU) 1272/2008(CLP)	Classification according to EU Directives 67/548/EEC or 1999/45/EC
10043-01-3 233-135-0 01-2119531538-36	Aluminium sulphate	20 - 30 %	Eye Dam. Category 1,H318	Xi ,R41

Further information

For the full text of the R-phrases mentioned in this Section, see Section 16.

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Show this safety data sheet to the doctor in attendance.

Inhalation

Move to fresh air.

Skin contact

Rinse with plenty of water. If skin irritation persists, call a physician. Remove and wash contaminated clothing and gloves, including the inside, before re-use.

Eye contact

Important! Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If possible use lukewarm water. Consult a physician. Continue rinsing eyes during transport to hospital.

Ingestion

Rinse mouth with water. Drink 1 or 2 glasses of water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : corrosive effects, May cause irreversible eye damage.

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Treatment : Rinse with plenty of water.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

- Extinguishing media : Not combustible.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable : No materials to be especially mentioned.
extinguishing media

5.2 Special hazards arising from the substance or mixture

Heating above the decomposition temperature will release toxic gases. (sulphur oxides (SO_x))

5.3 Special protective actions for fire-fighters

Exposure to decomposition products may be a hazard to health. In the event of fire, wear self-contained breathing apparatus. Protective clothing.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For personal protection see section 8. Soak up or flush with plenty of water to prevent slipping hazard. Handle in accordance with good industrial hygiene and safety practice.

6.2 Environmental precautions

Restrict the spread of the spillage by using inert absorbent material (sand, gravel). Cover the drains. Must be disposed of in accordance with local and national regulations.

6.3 Methods and materials for containment and cleaning up

Clean-up methods - small spillage

Dilute residues with water and then neutralize with lime or limestone powder to a solid consistency. Shovel or sweep up. Must be disposed of in accordance with local and national regulations.

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Clean-up methods - large spillage

Remove spill using a vacuum truck. Dilute residues with water and then neutralize with lime or limestone powder to a solid consistency. Shovel or sweep up remaining material. Must be disposed of in accordance with local and national regulations.

6.4 Reference to other sections

Inform the rescue service in case of entry into waterways, soil or drains.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Danger for slipping. The work place and work methods shall be organized in such a way that direct contact with the product is prevented or minimized. For personal protection see section 8.

7.2 Conditions for safe storage, including any incompatibilities

Avoid freezing. Keep away from incompatible materials.

For quality reasons:

Keep at temperatures below 30 °C.

Keep at temperatures above 0 °C. Handling operations become difficult due to increased viscosity.

Materials for packaging

Suitable material: plastic (PE, PP, PVC), polyester with fibreglass reinforcement, concrete coated with epoxy, titanium, acid-resistant steel, rubber-coated steel

Materials to avoid:

Avoid contact with unalloyed steel or galvanized surfaces., non-acid proof metals (for example aluminium, copper and iron), hypochlorites, chlorites, sulphites, Bases

Storage stability:

Storage period

12 Months

Other data

Stable under recommended storage conditions.

7.3 Specific end uses

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure Limit Values

8.1.1 Limit values in other countries

Finland:

Aluminium sulphate

HTP-arvot 8h = 1 mg/m³, Aluminium

Sweden:

Aluminium sulphate

NGV = 1 mg/m³, Calculated as Al

Germany:

Aluminium sulphate

MAK = 4 mg/m³, inhalable fraction, Calculated as Al

MAK = 1,5 mg/m³, respirable fraction, Calculated as Al

Biological occupational exposure limits = 0,2 mg/m³, Calculated as Al

Belgium:

Aluminium sulphate

TWA = 2 mg/m³, Calculated as Al

Switzerland:

Aluminium sulphate

TWA = 2 mg/m³, inhalable fraction

Denmark:

Aluminium sulphate

TWA = 1 mg/m³, Calculated as Al

Estonia:

Aluminium sulphate

TWA = 2 mg/m³, Calculated as Al

Spain:

Aluminium sulphate

TWA = 2 mg/m³, Calculated as Al

France:

Aluminium sulphate

VME = 2 mg/m³, Calculated as Al

Great Britain:

Aluminium sulphate

TWA = 2 mg/m³

Greece:

Aluminium sulphate

TWA = 2 mg/m³, Calculated as Al

Ireland:

Aluminium sulphate

TWA = 2 mg/m³

Lithuania:

Aluminium sulphate

TWA = 1 mg/m³

Netherlands:

Aluminium sulphate

TWA = 2 mg/m³, : Administrative

Norway:

Aluminium sulphate

VLA-ED = 2 mg/m³, Calculated as Al

Portugal:

Aluminium sulphate

TWA = 2 mg/m³

DNEL

Aluminium sulphate

- : End Use: Workers
Exposure routes: oral
Potential health effects: Long-term exposure - systemic effects
Value: 0,5 mg/kg bw/day
Calculated as AI
End Use: Workers
Exposure routes: Inhalation
Potential health effects: Long-term exposure - systemic effects
Value: 1,8 mg/m³
Calculated as AI

End Use: Consumers
Exposure routes: oral
Potential health effects: Long-term exposure - systemic effects
Value: 0,3 mg/kg bw/day
Calculated as AI
End Use: Consumers
Exposure routes: Inhalation
Potential health effects: Long-term exposure - systemic effects
Value: 1,1 mg/m³
Calculated as AI

PNEC

Aluminium sulphate

- : Sewage treatment plant
The PNEC value would be highly depending on conditions as pH and organic matter, and therefore a true PNEC cannot and does not need to be derived.

Oral

Bioaccumulative potential, Secondary poisoning, not significant, Derivation of the PNEC, Not relevant

Soil

study scientifically unjustified

Water

Not relevant, The compound is considered to have no long term effects in aquatic systems due to the rapid formation of insoluble hydroxides.

,The PNEC value would be highly depending on conditions as pH and organic matter, and therefore a true PNEC cannot and does not need to be derived.

Air
Not relevant

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice.

Eye wash bottle or emergency eye-wash fountain must be found in the work place.

8.2.2 Individual protection measures, such as personal protective equipment

Hand protection

Glove material: PVC and neoprene gloves

Protective gloves complying with EN 374.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough.

Break through time: > 480 min

Eye protection

Tightly fitting safety goggles or face-shield. Eye wash bottle with pure water

Skin and body protection

Wear protective clothing if necessary. Use rubber boots.

Respiratory protection

Respiratory protection is not required under normal handling conditions. If aerosols or mist are formed, eg. when cleaning containers with a high pressure washer, use half mask with dust filter P2.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

General Information (appearance, odour)

Physical state	liquid,
Colour	colourless, clear
Odour	not significant

Important health safety and environmental information

pH	ca. 2
Crystallisation point/range	-10 °C
Boiling point/boiling range	110 - 120 °C
Flash point	
Flammability (solid, gas)	not applicable, inorganic compound, In accordance with column 2 of REACH Annex VII, the study does not need to be conducted. Does not sustain combustion.
Explosive properties:	
Lower explosion limit	not applicable
Upper explosion limit	
Density	not applicable 1,28 - 1,32 g/cm ³
Solubility(ies):	
Water solubility	(20 °C) completely soluble
Partition coefficient: n-octanol/water	
Thermal decomposition	not applicable, inorganic compound, In accordance with column 2 of REACH Annex VII, the study does not need to be conducted. 650 °C
Viscosity:	
Viscosity, dynamic	20 mPa.s (20 °C)

9.2 Other data

10. STABILITY AND REACTIVITY

10.1 Reactivity

Corrosive to metals.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Contact with certain metals may form hydrogen gas, which in turn may form explosive mixtures of gases with air.

10.4 Conditions to avoid

Conditions to avoid : Avoid temperatures below crystallization range.

Avoid storage at high temperatures.

10.5 Incompatible materials

Materials to avoid : Avoid contact with unalloyed steel or galvanized surfaces.
non-acid proof metals (for example aluminium, copper and iron)
hypochlorites
chlorites
sulphites
Bases

10.6 Hazardous decomposition products

Hazardous decomposition products : sulphur oxides (SO_x)
Thermal decomposition : 650 °C

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

Aluminium sulphate:

LD50/Oral/rat: > 2.000 mg/kg
Not classified as harmful if swallowed.

LC50/Inhalation/rat: > 5 mg/l

Remarks: No known significant effects or critical hazards., Read-across (Analogy), CAS-No., 39290-78-3

LD50/Dermal/rabbit: > 5.000 mg/kg
Not classified as harmful to health.

Irritation and corrosion

Eyes:
May cause irreversible eye damage.

Aluminium sulphate:

Skin: rabbit/OECD Test Guideline 404: No skin irritation

Eyes: rabbit/OECD Test Guideline 405: Severe eye irritation

May cause irreversible eye damage.

Sensitisation

Aluminium sulphate:
guinea pig/OECD Test Guideline 406
Remarks: Read-across (Analogy) CAS-No. 1327-41-9
Not sensitizing.

Long term toxicity

Aluminium sulphate:

Repeated dose toxicity:

Oral/rat/OECD Test Guideline 422:

NOAEL: 562 mg/kg

Remarks: bw/day Systemic toxicity Read-across (Analogy) CAS-No. 1327-41-9

NOAEL: 90 mg/kg

Remarks: bw/day Calculated as AI

Oral/rat/OECD Test Guideline 422:

NOAEL: 112 mg/kg

Remarks: bw/day Local effects Read-across (Analogy) CAS-No. 1327-41-9

NOAEL: 18 mg/kg

Remarks: bw/day Calculated as AI

Carcinogenicity

Oral/rat/2 years:

Did not show carcinogenic effects in animal experiments.

Mutagenicity

Mutagenicity (Salmonella typhimurium - reverse mutation assay)/AMES test/OECD Test Guideline 471:

Result: negative

Metabolic activation: with and without

In vitro mammalian cells/micronucleus test/OECD Test Guideline 487:

Result: negative

Metabolic activation: with and without

In vitro gene mutation study in mammalian cells/Lymphoma/OECD Test Guideline 476:
Result: negative
Metabolic activation: with and without

Reproductive toxicity

Oral/rat/female/Reproductive effects/OECD Test Guideline 452:
NOAEL: 3.225 mg/kg
NOAEL F1:
Remarks: bw/day Read-across (Analogy) CAS-No. 31142-56-0
Not believed to be toxic for reproduction.

Oral/rat/female/Reproductive effects/OECD Test Guideline 452:
NOAEL: 300 mg/kg
NOAEL F1:
Remarks: bw/day Calculated as AI Read-across (Analogy) CAS-No. 31142-56-0

Oral/rat/male and female/Developmental toxicity test/OECD Test Guideline 422:
NOAEL: 1.000 mg/kg
NOAEL F1: 1.000 mg/kg
Remarks: bw/day Read-across (Analogy) CAS-No. 1327-41-9
Not believed to be toxic for reproduction. In animal studies, did not interfere with reproduction.

Oral/male and female/OECD Test Guideline 422:
NOAEL: 90 mg/kg
NOAEL F1: 90 mg/kg
Remarks: bw/day Calculated as AI Read-across (Analogy) CAS-No. 1327-41-9

Teratogenicity

Oral/rat/OECD Test Guideline 452:
NOAEL: 323 mg/kg
Mother: 3.225 mg/kg
bw/day Read-across (Analogy) CAS-No. 31142-56-0

Oral/rat/OECD Test Guideline 452:
NOAEL: 30 mg/kg
Mother: 300 mg/kg
bw/day Calculated as AI CAS-No. 31142-56-0 Read-across (Analogy)

Target organ

The substance is not classified.
STOT - repeated exposure

The substance is not classified.
STOT - single exposure

Human experience

Inhalation

Symptoms: Inhalation may provoke the following symptoms:, cough and difficulties in breathing

Skin contact

Symptoms: Repeated or prolonged skin contact may cause:, dry skin, irritation

Eye contact

Symptoms: Contact with eyes causes a smarting pain and a flood of tears., Risk of serious damage to eyes.

Ingestion

Symptoms: Ingestion may provoke the following symptoms:, Nausea, irritation of mouth, oesophagus and stomach

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity effects

Aquatic toxicity

— This material is not classified as dangerous for the environment. At environmentally relevant pH 5,5 – 8, the solubility of aluminium is low. Aluminium salts dissociate with water resulting in rapid formation and precipitation of aluminium hydroxides. At pH <5.5, the free ion (Al^{3+}) becomes the prevalent form, the increased availability at this pH is reflected in higher toxicity. At pH 6.0–7.5, solubility declines due to the presence of insoluble $Al(OH)_3$. At higher pH (pH >8.0), the more soluble $Al(OH)_4^-$ species predominate, which again increases availability.

Aluminium salts must not be released to rivers and lakes in an uncontrolled way and pH variations around 5 - 5.5 should be avoided.

Aluminium sulphate:

LC50/96 h/Danio rerio/semi-static test/OECD Test Guideline 203: > 562 mg/l

NOEC/96 h/Danio rerio/semi-static test/OECD Test Guideline 203: > 562 mg/l

LC50/96 h/Danio rerio/semi-static test/OECD Test Guideline 203: > 0,247 mg/l

Calculated as Al Maximum soluble concentration under the test conditions.

EC50/48 h/Daphnia magna (Water flea)/semi-static test/OECD Test Guideline 202: > 90 mg/l

NOEC/48 h/Daphnia magna (Water flea)/semi-static test/OECD Test Guideline 202: > 90 mg/l

LC50/48 h/Daphnia magna (Water flea)/OECD Test Guideline 202: > 0,176 mg/l

Calculated as Al Maximum soluble concentration under the test conditions.

EC50/72 h/Pseudokirchneriella subcapitata (green algae)/static test/OECD Test Guideline 201: 24 mg/l

EC50/72 h/Pseudokirchneriella subcapitata (green algae)/static test/OECD Test Guideline 201: 3,8 mg/l

Calculated as Al

NOEC/72 h/Pseudokirchneriella subcapitata (green algae)/static test/OECD Test Guideline 201: 1,7 mg/l

NOEC/72 h/Pseudokirchneriella subcapitata (green algae)/static test/OECD Test Guideline 201: 0,27

mg/l
Calculated as Al

Toxicity to other organisms

Aluminium sulphate:

no data available

12.2 Persistence and degradability

Biological degradability:

Remarks: When reacting with water on pH range 5,8 - 8 precipitates of aluminium hydroxides are formed. The methods for determining the biological degradability are not applicable to inorganic substances.

Biological degradability:

Aluminium sulphate:

The methods for determining the biological degradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water: not applicable, inorganic compound, In accordance with column 2 of REACH Annex VII, the study does not need to be conducted.

Aluminium sulphate:

The product is not expected to bioaccumulate.

Partition coefficient: n-octanol/water: not applicable, inorganic compound

12.4.Mobility in soil

Mobility

Water solubility: completely soluble (20 °C)

12.5. Results of PBT and vPvB assessment

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)., This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

12.6 Other adverse effects

May lower the pH of water and thus be harmful to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Classified as hazardous waste. Must be disposed of in accordance with local and national regulations. Thoroughly cleaned packaging material may be recycled.

Contaminated packaging

Classified as hazardous waste. Must be disposed of in accordance with local and national regulations.

14. TRANSPORT INFORMATION

14.1 UN number

3264

Land transport

ADR /RID:

Description of the goods:

14.2 UN proper shipping name

Corrosive liquid, acidic, inorganic n.o.s. (Aluminium sulphate)

14.3 Class

8

14.4 Packaging group:

III

Risk code

80

ADR/RID-Labels:

8

Sea transport

IMDG:

Description of the goods:

14.2 UN proper shipping name

UN3264, CORROSIVE LIQUID, ACIDIC, INORGANIC N.O.S. (ALUMINIUM SULPHATE)

14.3 Class:

8

14.4 Packaging group:

III

IMDG-Labels:

8

14.5 Environmentally Hazardous: Not a Marine Pollutant

Air transport

ICAO/IATA:

Description of the goods

14.2 UN proper shipping name

UN3264, Corrosive liquid, acidic, inorganic n.o.s. (Aluminium sulphate)

14.3 Class:

8

14.4 Packaging group:

III

ICAO-Labels:

8

14.6 Special precautions for user

The product is classified as dangerous goods, as it is slightly corrosive to metals.

15. REGULATORY INFORMATION

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

Other regulations : No restrictions identified other than those already covered in regulations.

15.2 Chemical Safety Assessment

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

16. OTHER INFORMATION

Full text of H-Statements referred to under section 3.

H318 Causes serious eye damage.

Text of R-phrases mentioned in Section 3

R41 Risk of serious damage to eyes.

Training advice

Read the safety data sheet before using the product.

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Sources of key data used to compile the Safety Data Sheet

Regulations, databases, literature, own tests.

Additions, Deletions, Revisions

Relevant changes have been marked with vertical lines.

1. Short title of Exposure Scenario: ES 2., Formulation and distribution, Aqueous solution

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC15: Use as laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available
Environmental release category	: ERC2: Formulation of preparations

2. Contributing scenario controlling environmental exposure for: ERC2: Formulation of preparations

Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
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Technical conditions and measures / Organizational measures

Remarks	: Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non-hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.
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2.1 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15, PROC19: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact), Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Production of preparations or articles by tabletting, compression, extrusion, pelletisation, Use as laboratory reagent, Hand-mixing with intimate contact and only PPE available

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: Aqueous solution
Vapour pressure	: < 0,1 hPa

Amount used

Remarks	: Varies between ml and m ³
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Frequency and duration of use

Remarks	: Covers daily exposures up to 8 hours (unless stated differently).
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Other operational conditions affecting workers exposure

Remarks	: Assumes use at not more than 20°C above ambient temperature., Assumes a good basic standard of occupational hygiene is implemented., Ensure operatives are trained to
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minimise exposures.

Technical conditions and measures

Process categories, 1, 2, 3, Handle substance within a closed system., Clear transfer lines prior to de-coupling.

Organisational measures to prevent /limit releases, dispersion and exposure

Process categories, 1, 2, 3, 4, 8a, 8b, 14, 15, No specific measures identified.

Clear spills immediately., Clean equipment and the work area every day.

Process categories, 19, Industrial use

5-25%:, Avoid carrying out operation for more than 1 hour.

1-5%:, Avoid carrying out operation for more than 4 hours.

<1%:, No specific measures identified.

Process categories, 19, Professional use

5-25%:, Avoid carrying out operation for more than 15 minutes.

or

Wear respiratory protection.

1-5%:, Avoid carrying out operation for more than 1 hour.

<1%:, Avoid carrying out operation for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection and gloves., Wear suitable gloves tested to EN374., Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Process category, 19, Professional use

5-25%:, Wear a respirator conforming to EN140 with Type A/P2 filter or better.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Concentration/DN EL):
PROC19	ECETOC TRA	Industrial use, 5-25%:, TRA duration factor 15 min - 1 h	Inhalation exposure	1,35 mg/m ³	0,75
PROC19	ECETOC TRA	Industrial use, 1-5%:, TRA duration factor 1 - 4 h	Inhalation exposure	1,35 mg/m ³	0,75
PROC19	ECETOC TRA	Industrial use, <1%:, TRA duration factor > 4 h	Inhalation exposure	1,12 mg/m ³	0,62
PROC19	ECETOC TRA	Professional use, 5-25%:, < 15 min	Inhalation exposure	1,69 mg/m ³	0,94
PROC19	ECETOC TRA	Professional use, 5-25%:, Half mask	Inhalation exposure	1,69 mg/m ³	0,94
PROC19	ECETOC TRA	Professional use, 1-5%:, TRA duration factor 15 min - 1 h	Inhalation exposure	1,12 mg/m ³	0,62
PROC19	ECETOC TRA	Professional use, <1%:, TRA duration factor 1 - 4 h	Inhalation exposure	1,69 mg/m ³	0,94

PROC19: Hand-mixing with intimate contact and only PPE available

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When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Worker exposure for this scenario has been assessed using ECETOC TRA V2.0.

1. Short title of Exposure Scenario: ES 3.,Use of substance in synthesis as a process chemical and as an intermediate.
 .Aqueous solution

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU6b, SU8, SU9, SU14: Manufacture of pulp, paper and paper products, Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals, Manufacture of basic metals, including alloys
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental release category	: ERC1, ERC2, ERC4, ERC5, ERC6a, ERC8a: Manufacture of substances, Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Wide dispersive indoor use of processing aids in open systems

2.Contributing scenario controlling environmental exposure for: ERC1, ERC2, ERC4, ERC5, ERC6a, ERC8a: Manufacture of substances, Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Wide dispersive indoor use of processing aids in open systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Technical conditions and measures / Organizational measures

Remarks : Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non-hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.

2.1 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent , PC20, PC21, PC26, PC19: Products such as ph-regulators, flocculants, pre-cipitants, neutralization agents, Laboratory chemicals, Paper and board dye, finishing and impregnation products: including bleaches and other processing aids, Intermediate

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Physical Form (at time of use) : Aqueous solution
 Vapour pressure : < 0,1 hPa

Amount used

Remarks : Varies between ml and m³

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature., Assumes a good basic standard of occupational hygiene is implemented., Ensure operatives are trained to minimise exposures.

Technical conditions and measures

Process categories, 1, 2, 3, Handle substance within a closed system., Clear transfer lines prior to de-coupling.

Organisational measures to prevent /limit releases, dispersion and exposure

Process categories, 1, 2, 3, 4, 8b, 15, No specific measures identified.
 Clear spills immediately.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection and gloves., Wear suitable gloves tested to EN374., Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Concentration/DN EL):
	ECETOC TRA	No specific measures identified.			< 1

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Worker exposure for this scenario has been assessed using ECETOC TRA V2.0.

1. Short title of Exposure Scenario: ES 6., Flocculant or coagulant in water and waste water treatment., Aqueous solution

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU2, SU5, SU6b, SU 10, SU23: Mining, (including offshore industries), Manufacture of textiles, leather, fur, Manufacture of pulp, paper and paper products, Formulation [mixing] of preparations and/ or re-packaging (excluding alloys), Electricity, steam, gas water supply and sewage treatment
Process category	: PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC19: Hand-mixing with intimate contact and only PPE available
Environmental release category	: ERC2, ERC4, ERC6b, ERC8a, ERC8b, ERC8d: Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of reactive processing aids, Wide dispersive indoor use of processing aids in open systems, Wide dispersive indoor use of reactive substances in open systems, Wide dispersive outdoor use of processing aids in open systems

2.Contributing scenario controlling environmental exposure for: ERC2, ERC4, ERC6b, ERC8a, ERC8b, ERC8d: Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of reactive processing aids, Wide dispersive indoor use of processing aids in open systems, Wide dispersive indoor use of reactive substances in open systems, Wide dispersive outdoor use of processing aids in open systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Technical conditions and measures / Organizational measures

Remarks : Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non-hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.

2.1 Contributing scenario controlling worker exposure for: PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC19: Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact), Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Hand-mixing with intimate contact and only PPE available , PC20, PC21, PC37: Products such as ph-regulators, flocculants, pre-cipitants, neutralization agents, Laboratory chemicals, Water treatment chemicals

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Physical Form (at time of use) : Aqueous solution
Vapour pressure : < 0,1 hPa

Amount used

Remarks : Varies between ml and m³

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature.

Technical conditions and measures

Process categories, 2, 3, Handle substance within a closed system.

Organisational measures to prevent /limit releases, dispersion and exposure

Process categories, 2, 3, 4, 5, 8a, 8b, 9, No specific measures identified., Clean equipment and the work area every day., Clear spills immediately.

Process categories, 19, Industrial use

5-25%:, Avoid carrying out operation for more than 1 hour.

1-5%:, Avoid carrying out operation for more than 4 hours.

<1%:, No specific measures identified.

Process categories, 19, Professional use

5-25%:, Avoid carrying out operation for more than 15 minutes.

1-5%:, Avoid carrying out operation for more than 1 hour.

<1%:, Avoid carrying out operation for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection and gloves., Wear suitable gloves tested to EN374., Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Process category, 19

5-25%:, Wear a respirator conforming to EN140 with Type A filter or better.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice : Assumes a good basic standard of occupational hygiene is implemented., Ensure operatives are trained to minimise exposures.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Concentration/DN EL):
PROC19	ECETOC TRA	Industrial use, 5-25%:, TRA duration factor 15 min - 1 h	Inhalation exposure	1,35 mg/m ³	0,75
PROC19	ECETOC TRA	Industrial use, 1-5%:, TRA duration factor 1 - 4 h	Inhalation exposure	1,35 mg/m ³	0,75
PROC19	ECETOC TRA	Industrial use, <1%:, TRA duration factor > 4 h	Inhalation exposure	1,12 mg/m ³	0,62
PROC19	ECETOC TRA	Professional use, 5-25%:, < 15 min	Inhalation exposure	1,69 mg/m ³	0,94
PROC19	ECETOC TRA	Professional use, 5-25%:, Half mask	Inhalation exposure	1,69 mg/m ³	0,94
PROC19	ECETOC TRA	Professional use, 1-5%:, TRA duration factor 15 min - 1 h	Inhalation exposure	1,12 mg/m ³	0,62
PROC19	ECETOC TRA	Professional use, <1%:, TRA duration factor 1 - 4 h	Inhalation exposure	1,69 mg/m ³	0,94

PROC19: Hand-mixing with intimate contact and only PPE available

PROC19: Hand-mixing with intimate contact and only PPE available

PROC19: Hand-mixing with intimate contact and only PPE available

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PROC19: Hand-mixing with intimate contact and only PPE available
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PROC19: Hand-mixing with intimate contact and only PPE available

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Worker exposure for this scenario has been assessed using ECETOC TRA V2.0.

1. Short title of Exposure Scenario: ES 7., Laboratory chemicals, Industrial use, Professional use, Aqueous solution

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU9: Manufacture of fine chemicals
Process category	: PROC15: Use as laboratory reagent
Environmental release category	: ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

2.Contributing scenario controlling environmental exposure for: ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
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Technical conditions and measures / Organizational measures

Remarks	: Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non-hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.
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2.1Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent , PC21: Laboratory chemicals

Product characteristics

Concentration of the Substance in	Covers the percentage of the substance in the product up to
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Mixture/Article : 100 % (unless stated differently).
 Physical Form (at time of use) : Aqueous solution
 Vapour pressure : < 0,1 hPa

Amount used

Remarks : Varies between ml and m³

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature., Assumes a good basic standard of occupational hygiene is implemented., Ensure operatives are trained to minimise exposures.

Organisational measures to prevent /limit releases, dispersion and exposure

Process categories, 15, No specific measures identified.
 Clear spills immediately., Clean equipment and the work area every day.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection and gloves., Wear suitable gloves tested to EN374., Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Concentration/DN EL):
	ECETOC TRA	No specific measures identified.			< 1

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Worker exposure for this scenario has been assessed using ECETOC TRA V2.0.