SAFETY DATA SHEET
Aluminium sulphate

According to Appendix D, OSHA Hazard Communication Standard 29 CFR §1910.1200

According to WHMIS 2015, in compliance with the Hazardous Product Act (HPA, as amended) and the requirements of the Hazardous Product Regulations (HPR)

1. Identification

Product identifier

Product name	**Aluminium sulphate**
Other names	Sulfuric acid, aluminum salt (3:2), tetradecahydrate Aluminum sulfate 14-hydrate Aluminum sulfate 16-hydrate Aluminum sulfate 18-hydrate
CAS No	Al2(SO4)3: 10043-01-3
Other CAS No	Al2(SO4)3•14 H2O: 16828-12-9 Al2(SO4)3•16 H2O: 16828-11-8 Al2(SO4)3•18 H2O: 7784-31-8

Recommended use of the chemical and restrictions on use

Identified uses	Water treatment chemical, Use of substance in synthesis as a process chemical and as an intermediate., Products such as pH-regulators, flocculants, precipitants, neutralization agents.
Uses advised against	Do not use for other purposes than the identified uses.

Details of the supplier of the safety data sheet

Supplier	Alliance Chemical 204 South Edmond St Taylor, Texas, 76574 512-365-6838

Emergency telephone number

CHEMTEL (800) 255-3924

2. Hazard(s) identification

Classification of the substance or mixture

Physical and Chemical Hazards	Not classified.
Human health	Eye dam. 1 - H318.
Environment	Not classified.
	The Full Text for all Hazard Statements are Displayed in Section 16.

Label elements

CAS No. 10043-01-3

Signal Word Danger

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Hazard Statements

H318	Causes serious eye damage.

Precautionary Statements

P261	Avoid breathing dust.
P264	Wash skin thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
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.

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

Substances

Product name	Aluminium sulfate
Chemical Formula	Al2(SO4)3·x H2O
Chemical Name	Aluminium sulfate
Content	>99 %
CAS-No.	10043-01-3
EC No.	233-135-0
Other CAS No	Al2(SO4)3•14 H2O: 16828-12-9 Al2(SO4)3•16 H2O: 16828-11-8 Al2(SO4)3•18 H2O: 7784-31-8

4. First-aid measures

Description of first aid measures

Inhalation
Move the exposed person to fresh air at once. Rinse nose and mouth with water. Get medical attention if any discomfort continues.

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.

Skin contact
Remove affected person from source of contamination. Remove contaminated clothing.
Wash the skin immediately with soap and water. Get medical attention if irritation persists after washing.

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. Do not rub the eyes, mechanical irritation. Continue rinsing eyes during transport to hospital.

Most important symptoms and effects, both acute and delayed
Corrosive effects, May cause irreversible eye damage.

Indication of immediate medical attention and special treatment needed
Treat symptomatically.

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5. Fire-fighting measures

Extinguishing media

Extinguishing media
Not combustible. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special hazards arising from the substance or mixture

Heating above the decomposition temperature will release toxic gases (Sulphur oxides (SOx)).

Advice for firefighters

Special Fire Fighting Procedures
Move container from fire area if it can be done without risk. Keep run-off water out of sewers and water sources.
Dike for water control.

Protective equipment for fire-fighters
Face mask, protective gloves and safety helmet.
Self contained breathing apparatus and full protective clothing must be worn in case of fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet. Do not smoke, use open fire or other sources of ignition. Avoid inhalation of dust. Avoid contact with eyes and prolonged skin contact. Provide adequate ventilation.

Environmental precautions

Avoid discharge into water courses or onto the ground. Must be disposed of in accordance with local and national regulations.

Methods and material for containment and cleaning up

Small spillage: Shovel or sweep up. Must be disposed of in accordance with local and national regulations.
Large spillage: Try to keep material dry. Remove spill using a vacuum truck. Shovel or sweep up remaining material. Must be disposed of in accordance with local and national regulations.

Reference to other sections

For personal protection, see section 8.
See section 11 for additional information on health hazards.
For waste disposal, see section 13.

7. Handling and storage

Precautions for safe handling

Read and follow manufacturer's recommendations. Do not eat, drink or smoke when using the product. Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation. Observe good chemical hygiene practices. Mechanical ventilation or local exhaust ventilation is required. The product is hygroscopic. Danger for slipping.

Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place. Keep away from food, drink and animal feeding stuffs. Avoid moisture. Avoid freezing. Avoid high temperatures. Keep away from incompatible materials.
Suitable packaging material: Plastic (PE, PP, PVC), fiberglass-reinforced polyester, epoxy- coated concrete, titanium, acidproof or rubber-coated steel.

Specific end uses(s)

For further information see attached Exposure Scenario.

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8. Exposure Controls/personal protection

Control parameters

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
Aluminium sulphate	WEL	---	2 mg/m^3	---	6 mg/m^3	---

Ingredient Comments
WEL = Workplace Exposure Limits

Derivation of DNEL(s) / DMEL(s)

DN(M)ELs for workers- Sulfuric acid, aluminum salt (3:2), tetradecahydrate

Exposure pattern	Route	Justification
Long-term - systemic effects	Dermal	3.8 mg/kg bw/day, Most sensitive endpoint: Neurotoxicity (oral)
Long-term - systemic effects	Oral	13.4 mg/m³, Most sensitive endpoint: Neurotoxicity (oral)

DN(M)ELs for workers- Aluminium sulphate

Exposure pattern	Route	Justification
Acute - systemic effects	Dermal	Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.
Acute - systemic effects	Inhalation	Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.
Acute - local effects	Dermal	Dermal load is very unlikely, but assuming that it occurs the user will have reacted on the burning/itching skin sensation and will automatically start using gloves. Concentrated solutions of the substance may be corrosive (pH < 2 or less) to skin and eye. At concentrations lower than those that cause corrosion, the substance will have no local effect and systemic toxicity. Dermal exposures should be regulated on the basis of risk to local effects (irritation, corrosion) on the skin. Further tests on this compound are therefore not necessary; this data requirement is not triggered.
Acute - local effects	Inhalation	Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.
Long-term - systemic effects	Dermal	Dermal load is very unlikely, but assuming that it occurs the user will have reacted on the burning/itching skin sensation and will automatically start using gloves. Concentrated solutions of the substance may be corrosive (pH < 2 or less) to skin and eye. At concentrations lower than those that cause corrosion, the substance will have no local effect and systemic toxicity. Dermal exposures should be regulated on the basis of risk to local effects (irritation, corrosion) on the skin. Further tests on this compound are therefore not necessary; this data requirement is not triggered.

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Exposure pattern	Route	Descriptor	DNEL / DMEL	(Corrected) Dose descriptor *)	Most sensitive endpoint
Long-term - systemic effects	Inhalation	DNEL (Derived No Effect Level)	20.2 mg/m³	NOAEC: 505.0 mg/m³ (based on AF of 25)	neurotoxicity
Justification					
For the DNEL derivation ECETOC (2010) and ECHA Guidance (2008) is followed. For the intraspecies (worker) the default value of ECETOC - AF 3 is used. Further for interspecies (allometric scaling) AF of 1 and an extra AF of 2.5 for the intraspecies (remaining differences) and for the adequacy / quality of database AF 2 from the ECHA is used. The Inhalation DNEL long term is derived for systemic effects (most critical neurotoxicty) based on one year developmental and chronic neurotoxic oral rat study of aluminium citrate with rats (2010) The NOAEL (neurotoxicity) from this study was found to be 323 mg Al Citrate / kg bw/day [equivalent with 30 mg Al 3+/kg bw / day]. The NOAEL of Aluminum citrate is recalculated to a NOAEL of 345 mg/kg bw/ day for the aluminium substance, using the aluminium content.					

Exposure pattern	Route	Justification
Long-term - local effects	Dermal	Dermal load is very unlikely, but assuming that it occurs the user will have reacted on the burning/itching skin sensation and will automatically start using gloves. Concentrated solutions of the substance may be corrosive (pH < 2 or less) to skin and eye. At concentrations lower than those that cause corrosion, the substance will have no local effect and systemic toxicity. Dermal exposures should be regulated on the basis of risk to local effects (irritation, corrosion) on the skin. Further tests on this compound are therefore not necessary; this data requirement is not triggered.
Long-term - local effects	Inhalation	Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.
**) The (corrected) dose descriptor starting points have been automatically calculated by multiplying the values of the fields "D(N)MEL" and "Assessment factor" provided in the Endpoint summary of IUCLID section 7. Toxicological information. It reflects the value after any corrections, e.g. route-to-route extrapolation. See column "Justification" for the rationale behind such modifications and the use of assessment factors.*		

DN(M)ELs for the general population- Aluminium sulphate

Exposure pattern	Route	Justification
Acute - systemic effects	Dermal	Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.
Acute - systemic effects	Inhalation	Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.
Acute - systemic effects	Oral	Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.
Acute - local effects	Dermal	Not relevant. Dermal load is very unlikely, but assuming that it occurs the user will have reacted on the burning/itching skin sensation and will automatically start using gloves. Concentrated solutions of the substance may be corrosive (pH < 2 or less) to skin and eye. At concentrations lower than those that cause corrosion, the substance will have no local effect and systemic toxicity. Dermal exposures should be regulated on the basis of risk to local effects (irritation, corrosion) on the skin. Further tests on this compound are therefore not necessary; this data requirement is not triggered.

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Exposure pattern	Route	Justification
Acute - local effects	Inhalation	Not relevant. Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.
Long-term - systemic effects	Dermal	Not relevant. Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.
Long-term - systemic effects	Inhalation	Not relevant. Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.

Exposure pattern	Route	Descriptor	DNEL / DMEL	(Corrected) Dose descriptor *)	Most sensitive endpoint
Long-term - systemic effects	Oral	DNEL (Derived No Effect Level)	3.4 mg/kg bw/day	NOAEL: 340.0 mg/kg bw/day (based on AF of 100)	neurotoxicity

Justification

For the DNEL derivation ECETOC (2010) and ECHA Guidance (2008) is followed. For the intraspecies (worker) the default value of ECETOC - AF 5 is used. Further for interspecies (allometric scaling) AF of 4 is used. An extra AF of 2.5 for the intraspecies (remaining differences) and for the adequacy / quality of database AF 2 from the ECHA is used. The Inhalation DNEL long term is derived for systemic effects (most critical neurotoxicty) based on one year developmental and chronic neurotoxic oral rat study of aluminium citrate with rats (2010) The NOAEL (neurotoxicity) from this study was found to be 323 mg Al Citrate / kg bw/day [equivalent with 30 mg Al 3+/kg bw / day]. The NOAEL of Aluminum citrate is recalculted to a of NOAEL 345 mg/kg bw/ day for the aluminium substanc, using the aluminium content.

Exposure pattern	Route	Justification
Long-term - local effects	Dermal	Not relevant. Dermal load is very unlikely, but assuming that it occurs the user will have reacted on the burning/itching skin sensation and will automatically start using gloves. Concentrated solutions of the substance may be corrosive (pH < 2 or less) to skin and eye. At concentrations lower than those that cause corrosion, the substance will have no local effect and systemic toxicity. Dermal exposures should be regulated on the basis of risk to local effects (irritation, corrosion) on the skin. Further tests on this compound are therefore not necessary; this data requirement is not triggered.
Long-term - local effects	Inhalation	Not relevant. Not relevant. Based on the physical and chemical properties, the hazard assessment and use of the substance.

**) The (corrected) dose descriptor starting points have been automatically calculated by multiplying the values of the fields "D(N)MEL" and "Assessment factor" provided in the Endpoint summary of IUCLID section 7. Toxicological information. It reflects the value after any corrections, e.g. route-to-route extrapolation. See column "Justification" for the rationale behind such modifications and the use of assessment factors.*

Predicted No Effect Concentration (PNEC) - Aluminium sulphate

PNEC water

freshwater	0.3 µg/l
marine	0.03 µg/l

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PNEC sediment
The risks for sediment dwelling organisms are negligible because the bioavailability of aluminum in sediment is low. In general, the solubility and mobility of aluminum in sediment is greatest when the sediment is rich in organic matter capable of forming aluminum- organic complexes and when the pH is low.
The PNEC value would be highly depending on environmental conditions as pH and organic matter, and therefore a true PNEC cannot and does not need to be derived.

PNEC soil
The PNEC is 1 mg/kg dw at a pH of 3.4. At higher pH levels the PNEC value will be higher.

PNEC for sewage treatment plant
The EC10 is 200 mg/l Al, this gives a PNEC of 20 mg/l Al.

Exposure controls

Protective equipment

Process conditions
Provide eyewash station.

Engineering measures
Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of vapours.

Respiratory equipment
In case of inadequate ventilation or risk of inhalation of dust, use half mask with dust filter P2.

Hand protection
For prolonged or repeated skin contact use suitable protective gloves. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material.
Glove material: PVC and neoprene gloves.

Eye protection
If risk of splashing, wear safety goggles or face shield (EN 166).

Hygiene measures
DO NOT SMOKE IN WORK AREA! Wash hands at the end of each work shift and before eating, smoking and using the toilet. Promptly remove any clothing that becomes contaminated. Use appropriate skin cream to prevent drying of skin. When using do not eat, drink or smoke.

Skin protection
Wear apron or protective clothing in case of contact.

Environmental Exposure Controls
Residues and empty containers should be taken care of as hazardous waste according to local and national provisions.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance	Solid, granules.
Colour	White.
Odour	No data available.
Solubility	Soluble in water.

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Melting point	80-100°C
Boiling Point	>300°C
pH Value	3-3,70 (%1)
Decomposition temperature	770°C
Flash point	Not applicable, inorganic compound.
Flammability (solid, gas)	Does not sustain combustion.
Density	1.65 - 1.7 g/cm³
Explosion Limits – Lower/ Upper	No data available.
Viscosity, kinematic	No data available.
Oxidising properties	Not oxidizing

Other information

Bulk density	No data available.

10. Stability and reactivity

Reactivity
Can corrode base metals in the presence of water.

Stability
Stable under normal temperature conditions and recommended use. Stable under the prescribed storage conditions.

Possibility of hazardous reactions
Corrodes metals under influence of moisture.

Conditions to avoid
Corrosion might appear in contact with moisture. Humidity or contact with water may cause lumpiness.

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

Hazardous decomposition products
Sulphur oxides (SOx).

11. Toxicological information

Information on toxicological effects

Acute toxicity
Based on available data the classification criteria are not met.

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.

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Sulfuric acid, aluminum salt (3:2), tetradecahydrate:

LD50/Oral/Rat: > 2,000 mg/kg
Remarks: CAS-No., 10043-01-3
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.

LD50/Dermal/Rabbit: > 5,000 mg/kg
Not classified as harmful to health.

Skin corrosion/irritation
Based on available data the classification criteria are not met.
Repeated or prolonged skin contact may cause: Skin irritation dry skin.

Aluminium sulphate:
Skin: Rabbit/OECD Test Guideline 404: No skin irritation

Sulfuric acid, aluminum salt (3:2), tetradecahydrate:
Skin: Rabbit/OECD Test Guideline 404: No skin irritation
Remarks: CAS-No. 10043-01-3

Serious eye damage/irritation
Causes serious eye damage.

Aluminium sulphate:
Eyes: Rabbit/OECD Test Guideline 405: Severe eye irritation.
May cause irreversible eye damage.

Sulfuric acid, aluminum salt (3:2), tetradecahydrate:
Eyes: Rabbit/OECD Test Guideline 405: Severe eye irritation
Remarks: May cause irreversible eye damage

Skin or Respiratory sensitization
Based on available data the classification criteria are not met.

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

Germ cell mutagenicity
Based on available data the classification criteria are not met.

Aluminium sulphate:
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

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Sulfuric acid, aluminum salt (3:2), tetradecahydrate:
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

Carcinogenicity
Based on available data the classification criteria are not met.

Aluminium sulphate:
Oral/Rat/2 years:
Did not show carcinogenic effects in animal experiments.

Sulfuric acid, aluminum salt (3:2), tetradecahydrate:
Oral/Rat/2 years:
Did not show carcinogenic effects in animal experiments.

Reproductive toxicity
Based on available data the classification criteria are not met.

Aluminium sulphate:
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 Al 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 Al Read-across (Analogy) CAS-No. 1327-41-9

Sulfuric acid, aluminum salt (3:2), tetradecahydrate:
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:

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Remarks: bw/day Calculated as Al Read-across (Analogy) CAS-No. 31142-56-0
Not believed to be toxic for reproduction.

Rat/male and female/Screening 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
No known effect.

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

Teratogenicity

Aluminium sulphate:
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 Al CAS-No. 31142-56-0 Read-across (Analogy)

Sulfuric acid, aluminum salt (3:2), tetradecahydrate:
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 Al CAS-No. 31142-56-0 Read-across (Analogy)

Specific target organ toxicity - single exposure
Based on available data the classification criteria are not met.

Specific target organ toxicity - repeated exposure
Based on available data the classification criteria are not met.

Aspiration hazard
Based on available data the classification criteria are not met.

Human experience

Inhalation
Symptoms: Cough and difficulties in breathing.

Skin contact
Symptoms: Effects of repeated or prolonged skin contacts may include: Dry skin, irritation.

Eye contact
Symptoms: Contact with eyes causes a smarting pain and a flood of tears. Risk of serious damage to eyes.
Remarks: The product may harm the cornea by mechanical action.

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

12. Ecological Information

Ecotoxicity
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 (Al3+) 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

Sulfuric acid, aluminum salt (3:2), tetradecahydrate:
LC50/96 h/Danio rerio/semi-static test/OECD Test Guideline 203: > 1,000 mg/l
NOEC/Danio rerio/semi-static test/OECD Test Guideline 203: > 1,000 mg/l
LC50/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: > 160 mg/l
NOEC/48 h/Daphnia magna (Water flea)/semi-static test/OECD Test Guideline 202: > 160 mg/l
EC50/48 h/Daphnia magna (Water flea)/semi-static test/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: > 41.5 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: 3.0 mg/l
NOEC/72 h/Pseudokirchneriella subcapitata (green algae)/static test/OECD Test Guideline 201: 0.27 mg/l Calculated as Al

Persistence and degradability
Biological degradability:
The methods for determining the biological degradability are not applicable to inorganic substances.
Chemical degradation:
Remarks: Reaction with water forms aluminium hydroxide precipitates.

Bioaccumulative potential
The product is not expected to bioaccumulate.

SAFETY DATA SHEET
Aluminium sulphate

According to Appendix D, OSHA Hazard Communication Standard 29 CFR §1910.1200

According to WHMIS 2015, in compliance with the Hazardous Product Act (HPA, as amended) and the requirements of the Hazardous Product Regulations (HPR)

Mobility in soil
Mobility
The product is soluble in water.

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.

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

13. Disposal considerations

Waste treatment methods
When handling waste, consideration should be made to the safety precautions applying to handling of the product.

General information
Dispose of waste and residues in accordance with local authority requirements. Dispose of on site landfill area.

14. Transport information

General
The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, TDG, DOT)

UN number
No information required.

UN proper shipping name
No information required.

Transport hazard class(es)
No information required.

Packing group
No information required.

Environmental hazards
Environmentally Hazardous Substance/Marine Pollutant No.

Special precautions for user
No information required.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not relevant.

15. Regulatory information

International Regulations

US Federal Regulations

SARA Section 302 Extremely Hazardous Substances Tier II Threshold Planning Quantities
None of the ingredients are listed or exempt.

CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA)
None of the ingredients are listed or exempt.

SAFETY DATA SHEET
Aluminium sulphate

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SARA Extremely Hazardous Substances EPCRA Reportable Quantities
None of the ingredients are listed or exempt.

SARA 313 Emission Reporting
None of the ingredients are listed or exempt.

CAA Accidental Release Prevention
None of the ingredients are listed or exempt.

FDA - Essential Chemical
None of the ingredients are listed or exempt.

FDA - Precursor Chemical
None of the ingredients are listed or exempt.

SARA (311/312) Hazard Categories
None of the ingredients are listed or exempt.

OSHA Highly Hazardous Chemicals
None of the ingredients are listed or exempt.

US State Regulations

California Proposition 65 Carcinogens and Reproductive Toxins
None of the ingredients are listed or exempt.

California Air Toxics "Hot Spots" (A-I)
None of the ingredients are listed or exempt.

California Air Toxics "Hot Spots" (A-II)
None of the ingredients are listed or exempt.

California Directors List of Hazardous Substances
None of the ingredients are listed or exempt.

Massachusetts "Right To Know" List
None of the ingredients are listed or exempt.

Rhode Island "Right To Know" List
None of the ingredients are listed or exempt.

Minnesota "Right To Know" List
None of the ingredients are listed or exempt.

New Jersey "Right To Know" List
None of the ingredients are listed or exempt.

Pennsylvania "Right To Know" List
None of the ingredients are listed or exempt.

Inventories

US - TSCA
Ingredients are listed.

SAFETY DATA SHEET
Aluminium sulphate

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US - TSCA 12(b) Export Notification
Ingredients are listed.

Canada – DSL/NDSL
Ingredients are listed.

16. Other information

Abbreviations used in safety data sheet
ADR: European Agreement on International Carriage of Dangerous Goods by Road.
ADN: European Agreement on the International Carriage of Dangerous Goods by Inland Waterways. RID: European Agreement on International Carriage of Dangerous Goods by Rail.
IATA: International Air Transport Association
ICAO-TI: Technical Specification for Safe Transport of Dangerous Goods by Air.
IMDG: International Maritime Dangerous Goods.
TWA: Time weighted average
ATE: Estimated value of acute toxicity
EC No: European Community number
CAS: Chemical Theory Service.
LD50: Substance that causes 50% (half) death in the test animals group (Median Fatal Dose).
LC50: Substance concentration causing 50% (half) death in the test animals group.
EC50: Effective Concentration of the substance causing the maximum of 50%.
PBT: Persistent, Bioaccumulative and Toxic substance.
vPvB: Very Permanent, Very Biofriendly.
SEA: Classification, labeling, packaging regulation
DNEL: Derivative Inactive Level
PNEC: Estimated Unaffected Concentration
STOT: Specific Target Organ Toxicity

Revision Comments
This form is designed for the first time for this product.

Hazard Statements In Full
H318 Causes serious eye damage.

Issued Note
This SDS is prepared based on the information and documents received from product owner. CRAD or/and SDS author shall not be responsible for incorrect preapared of SDS and pecuniary loss or intangible damages because of deficient or wrong information and documents which comes from product owner.

Disclaimer

This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.