



Chemifloc Ltd.

SAFETY DATA SHEET PolyAluminium Chloride 10% Solution

Conforms to Regulation (EC) No1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

Section 1: Identification of the substance and of the company/undertaking

Identification of the substance or mixture

Product Name: Polyaluminium Chloride
Chemical Name: Aluminium chloride hydroxide sulfate
Registration Number: 01-2119531540-51-0010.
Synonyms: Polyaluminium Chloride Hydroxide, Polyaluminium Chloride Hydroxide Sulfate, PAC, PACS.

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

Identified uses Use of aluminium salts in the treatment of raw water in the supply of either potable water or industrial process water
Use of aluminium salts to treat waste water and in sludge treatment at waste water treatment plants (WWTP's)

Uses advised against None

Details of the supplier of the safety data sheet

Manufacturer: Chemifloc Ltd
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Co. Clare,
Rep. of Ireland.
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**Emergency Telephone Number: National Poison Information Centre,
00353 1 8379964**

Section 2: Hazards Identification

Classification of the substance

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classificatory applies.

Classification according to Regulation (EC) no 1272/2008 as amended

Health hazards

Serious eye damage/eye irritation Category 2 H319 6 Causes serious eye irritation

Hazard summary

Physical hazards Not classified for physical hazards.

Health hazards Irritating to eyes. Occupational exposure to the substance may cause adverse health effects

Environmental hazards Not classified for hazards to the environment.

Specific hazards Not available

Main symptoms Not available.

Label elements**Label according to Regulation (EC) No. 1272/2008 as amended****Contains:** Aluminium chloride hydroxide sulfate

Signal word Warning
Hazard statements H319 - Causes serious eye irritation

Precautionary statements

Prevention P280 ó Wear eye/face protection
P264 - Wash hands thoroughly after handling.
Response P305+351+338 ó IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
P337+313 - If eye irritation persists: Get medical advice/attention.

Hazardous components which must be listed on the label:

39290-78-3 Aluminium chloride hydroxide sulfate

Further information The product is classified and labeled in accordance with EC directives or respective national laws.

Other hazards: H290 Corrosive to metals only applies if pH <2

Section 3: Composition/Information on Ingredients**Substance****General information**

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Aluminium chloride hydroxide sulfate	25	39290-78-3 254-400-7	01-2119531540-51-0010	-	#
Water	75	7732-18-5			

Classification: CLP: Eye Irr. 2;H319**Composition comments** The full text for all H-phrases is displayed in section 16.**Section 4: First Aid Measures****General information** Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. No hazards which require special first aid measures.**Description of first aid measures****Inhalation** Move to fresh air. Call a physician if symptoms develop or persist.**Skin contact** Immediately flush skin with plenty of water. Get medical attention if irritation develops or persists.**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.**Ingestion** If ingestion of a large amount does occur, seek medical attention. Rinse mouth with water.**Most important symptoms and effects, both acute and delayed** Corrosive effects, May cause irreversible eye damage.**Indication of any immediate medical attention and special treatment needed** Rinse with plenty of water.

Section 5: Firefighting measures

General fire hazards	Non-combustible, substance itself does not burn.
Extinguishing media	
Suitable extinguishing media	Use fire-extinguishing media appropriate for surrounding materials.
Unsuitable extinguishing Media	None known.
Special hazards arising from the substance or mixture	The product itself does not burn. No unusual fire or explosion hazards noted. May decompose upon heating to produce corrosive and/or toxic fumes. Material is not combustible, but may release toxic vapours (hydrogen chloride, oxides of sulphur) when heated above 200°C. If fumes are present, use an approved full-face-respirator with acid cartridge. Use extinguishing media appropriate to the surrounding fire conditions.
Advice for firefighters	
Special protective equipment for firefighters	Wear self-contained breathing apparatus and protective clothing.
Special firefighting procedures	No unusual fire or explosion hazards noted.

Section 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures	
For non-emergency personnel	Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Stay upwind.
For emergency responders	Not available.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water.
Methods and material for containment and cleaning up	Should not be released into the environment. Prevent entry into waterways, sewers, basements or confined areas. Large Spills: Dike the spilled material, where this is possible. Soak up with inert absorbent material. Cover with plastic sheet to prevent spreading. Absorb spillage to prevent material damage. Absorb in vermiculite, dry sand or earth and place into containers. Sweep up or gather material and place in appropriate container for disposal. Following product recovery, flush area with water. After removal flush contaminated area thoroughly with water. Clean up in accordance with all applicable regulations. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. This material and its container must be disposed of as hazardous waste. After removal flush contaminated area thoroughly with water. This material and its container must be disposed of as hazardous waste. For waste disposal, see Section 13.
Reference to other sections	Not available.

Section 7: Handling and storage

Precautions for safe handling	Avoid contact with eyes. Avoid prolonged exposure. Wash hands thoroughly after handling. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.
Conditions for safe storage, including any incompatibilities	Keep container tightly closed. Keep only in the original container. Store in corrosive resistant/container with a resistant inner liner. Keep out of the reach of children. Store in rubber lined mild steel or plastic tanks. Avoid freezing. Keep away from incompatible materials.
Materials for packaging:	Suitable material: plastic (PE, PP, PVC), fiberglass-reinforced polyester, epoxy-coated concrete, titanium, acid proof or rubber-coated steel.
Materials to avoid:	Bases, non-acid proof metals (for example aluminium, copper and iron), Avoid contact with unalloyed steel or galvanized surfaces.

Other data:	Stable under recommended storage conditions.
Specific end use(s)	The specified uses for this material are shown in section 1 of this document.

Section 8: Exposure controls / personal protection

Control parameters

Occupational exposure limits

Ireland
United Kingdom

Components	Type	Value	Form
Aluminium salts	TWA	2 mg/m ³	Soluble aluminium salts

Biological limit values No biological exposure limits noted for the ingredient(s).

Recommended monitoring procedures Not available.

DNEL

Components	Type	Route	Value	Form
Aluminium salts	Industry	Oral	0.5 mg/kg bw/day	as Al
	Professional	Oral	0.3 mg/kg bw/day	as Al

PNEC Not available.

Exposure Controls

Appropriate engineering controls Ventilation should be sufficient to effectively remove and prevent build-up of any dusts or fumes that may be generated during handling or thermal processing. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn.

Individual protection measures, such as personal protective equipment.

General information Use personal protective equipment as required. Eye wash fountain is recommended. Keep working clothes separately.

Eye/face protection Wear eye/face protection. (EN166)

Skin protection

- **Hand protection** PVC or other plastic material gloves. (EN374)

- **Other** Normal work clothing (long sleeved shirts and long pants) is recommended.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Thermal hazards Not available

Section 9: Physical and chemical properties

Information on basic physical and chemical properties

General information (Appearance, odour)

Physical State	Aqueous solution
Colour	Colourless to pale yellow.
Odour	Not significant

Important health safety and environmental information

pH	2.0 to 3.0
Melting point/range	-10 to -15 °C
Boiling point / range	not applicable, In accordance with column 2 of REACH Annex VII, the study does not need to be conducted.
Flash point	not applicable, In accordance with column 2 of REACH Annex VII, the study does not need to be conducted., inorganic compound
Flammability (solid, gas)	does not sustain combustion.
Explosive properties	
- Lower explosive limit	not applicable
- Upper explosive limit	
Vapour Pressure	not applicable, In accordance with column 2 of REACH Annex VII, the study does not need to be conducted.
Density	1.21 g/cm ³

Molecular Formula:	$\text{Al}(\text{OH})_a\text{Cl}_b(\text{SO}_4)_c$ with $(a+b+2c) = 3$, and $a > 1.05$.
Solubility(ies)	
- Water solubility	miscible in water. Diluted solutions hydrolyse to precipitate $\text{Al}(\text{OH})_3$.
Partition coefficient (n-octanol/water)	not applicable, inorganic compound.
Thermal Decomposition	200°C.

Section 10: Stability and reactivity

Reactivity	Can corrode base metals in the presence of water.
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Corrodes metals under influence of moisture.
Conditions to avoid	Reacts violently with strong alkaline substances. This product may react with reducing agents. Do not mix with other chemicals.
Incompatible materials	Bases, non-acid proof metals (for example aluminium, copper and iron) Avoid contact with unalloyed steel or galvanized surfaces. Incompatible with other polyaluminium salts. Special care has to be taken regarding mixing with other products previously used for water treatment, such as aluminium sulfate, in order to avoid gel formation or precipitation. Avoid contact with chlorites, hypochlorites, and sulphites. Incompatible with iron salts and aluminium sulfate
Hazardous decomposition products	May release toxic vapours (hydrogen chloride, oxides of sulphur).
Thermal decomposition	200°C.

Section 11: Toxicological information

Information on toxicological effects

Acute toxicity

LD50/Oral/rat: > 2000 mg/kg

Not classified as harmful if swallowed.

/Inhalation/rat:

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

LD50/Dermal/rabbit: > 5000 mg/kg

Not classified as harmful to health.

Irritation and corrosion

Eye May cause irreversible eye damage.

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

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

Sensitisation

guinea pig/OECD Test Guideline 406

Remarks: Read-across (Analogy) CAS-No. 1327-41-9

Not sensitizing.

Long term toxicity

Repeated dose toxicity:

Oral/rat/female/6 weeks/OECD Test Guideline 452: NOAEL: 3225 mg/kg

Remarks: Read-across (Analogy) CAS-No. 31142-56-0

Oral/rat/OECD Test Guideline 426: NOAEL: 323 mg/kg

Remarks: Read-across (Analogy) CAS-No. 31142-56-0

Oral/rat: NOAEL: 200 mg/kg

Remarks: Read-across (Analogy) CAS-No. 1327-41-9

Remarks: No known significant effects or critical hazards.

Carcinogenicity Oral/rat/2 years: Did not show carcinogenic effects in animal experiments.

Mutagenicity mammalian cells (CHO)/AMES test/OECD Test Guideline 471: Result: negative
micronucleus test/OECD Test Guideline 487: Result: negative
mammalian cells (CHO)/Mutation test: in vivo/OECD TG 476: Result: negative
/Escherichia coli: Result: negative

Reproductive toxicity

Oral/6 weeks/rat/female/Reproductive effects/OECD Test Guideline 452: NOAEL: 3225 mg/kg NOAEL F1:
Remarks: 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: 1000 mg/kg NOAEL F1:
Remarks : Read-across (Analogy) CAS-No. 1327-41-9
No known effect

Teratogenicity

Oral/rat/OECD Test Guideline 452:NOAEL: 1.075 mg/kg
Read-across (Analogy) Did not show mutagenic or teratogenic effects in animal experiments. CAS-No. 31142-56-0

Target organ

The mixture is not classified. STOT - repeated exposure
The mixture is not classified. STOT - single exposure

Human experience

Inhalation

Not available.

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 irritation to eyes.

Ingestion

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

Section 12: Ecological information

Toxicity

Remarks:

This material is not classified as dangerous for the environment.
Within pH range approx. 5 - 5.5, aluminium ions may be harmful to salmon species.
Aluminium salts must not be released to rivers and lakes in an uncontrolled way and pH variations around 5 - 5.5 should be avoided.
At pH values around neutral aluminium salts are not harmful to fish.

Toxicity to fish (Components)

LC50: > 1000 mg/l Exposure time: 96 h
Species: Danio rerio Method: OECD Test Guideline 203
NOEC: > 1000 mg/l

Toxicity to daphnia and other aquatic invertebrates.

EC50: > 160 mg/l Exposure time: 48 h: Species: Daphnia magna (Water flea):
Method: OECD Test Guideline 202
NOEC: 160 mg/l :Species: Daphnia magna (Water flea)

Toxicity to algae

IC50: Exposure time: 72 h: Species: algae
Remarks:
Not applicable because the phosphorus in the algae growth medium is precipitated by aluminium salts and because aluminium ions are masked by the complexing agents in the algae growth medium (expert opinion).

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

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

Mobility in soil**Mobility** water solubility ó soluble**Results of PBT and vPvB assessment**

This mixture is not considered to be persistent, bioaccumulating nor toxic (PBT).

This mixture is not considered to be very persistent nor very bioaccumulating (vPvB).

Other adverse effects

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

Section 13: Disposal considerations**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.

Section 14: Transport information

ADR	Not classified as dangerous in the meaning of transport regulations.
IATA	Not classified as dangerous in the meaning of transport regulations.
IMDG	Not classified as dangerous in the meaning of transport regulations.

Section 15: Regulatory information**Safety, health and environmental regulations/legislation specific for the substance or mixture****EU Regulations****Regulation (EC) No. 2037/2000 on substances that deplete the ozone layer, Annex I**

Not listed.

Regulation (EC) No. 2037/2000 on substances that deplete the ozone layer, Annex II

Not listed.

Regulation (EC) No. 850/2004 on persistent organic pollutants, Annex I

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V

Not listed.

Directive 96/61/EC concerning integrated pollution prevention and control (IPPC): Article 15, European Pollution Emission Registry (EPER)

Not listed.

Regulation (EC) No. No1907/2006 (REACH) with its amendment Regulation (EU) 2020/878, Article 59(1).**Candidate List**

Not listed.

National regulations Not available.

Other regulations This Safety Data Sheet complies with the requirements of Regulation (EC) No No1907/2006 (REACH) with its amendment Regulation (EU) 2020/878. No restrictions identified other than those already covered in regulations.

Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for the components of this mixture.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances(PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

Section 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H290	May be corrosive to metals
H319	Causes serious eye irritation.

Training advice Not available

Further information

Polyaluminium chloride solutions are used as chemicals for the treatment of drinking water, as approved by the European Committee for Standardisation under EN 883:2004. The Transport and Regulatory Information given are in accordance with EN 883:2004. However, that document indicates that polyaluminium chloride solutions fall under Packing Group I, as a "Substance presenting high danger". As part of the ongoing REACH registration process the 18% product has been reclassified and is assigned to Packing Group II (medium danger), because of the low pH measured.

Previously, polyaluminium chloride solutions from Chemifloc Limited (both 10% and 18%) were classified by as being Corrosive for both supply and transport. As part of the ongoing REACH registration process, the 10% formulation has been re-classified as being an Irritant, and non-hazardous for transport. No change has been made to the classification for the 18% solution.

Notes on storage conditions and product stability

Polyaluminium chloride solutions are stable indefinitely when stored under benign conditions (sealed vessel, constant temperature). However, some users may experience product instability, which can arise from two potential problems:

- 1) The product is designed to break down on contact with water, to allow water treatment to occur. As a result, water vapour condensing on inside tank surfaces may lead to colourless crystals forming when the water drops back into the bulk liquid. These crystals can only be dissolved using hot water. Condensation should thus be minimised by tank design and location. If possible, avoid tanks that are dark in colour, in direct sunlight, and off the ground, as these factors will lead to large day/night temperature fluctuations.

- 2) Long-term storage in open/vented vessels may result in evaporation of water, leading to over concentration of the PAC, and formation of a very fine, cream-coloured deposit. This deposit is easily dissolved in cold water.

Chemifloc Limited thus recommends that tanks be designed to minimise temperature effects, have a top hatch to allow routine quarterly inspection for any deposits, and have a bottom drain in case the need for washout occurs. In addition, when switching from the use of another water treatment chemical to PAC, the user is strongly recommended to wash out the tanks and dosing system to remove any incompatible materials before the PAC is unloaded.

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. Please call for document accuracy if the revision date has exceeded 3 years.

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