

**EXTENDED MATERIAL SAFETY DATA SHEET**  
**(According to EC Regulations nr. 1907 / 2006 REACH ;nr. 1272/2008; nr. 453/2010)**

**TECHNICAL ALUMINIUM SULFATE**

**1. PRODUCT AND MANUFACTURER IDENTIFICATION:**

**1.1. Substance identification:**

- EC number: 233-135-0
  - CAS number (from EC inventory) : 10043-01-3
  - Trade name: ALUMINIUM SULFATE
  - EC name: aluminium sulphate
  - CAS name: sulfuric acid aluminium salt
  - IUPAC name: aluminium sulfate
  - Chemical formula:  $Al_2(SO_4)_3 \cdot nH_2O$
  - Molecular weight: 666,14
  - Structural formula:
- $$\begin{array}{c}
 SO_3^- \quad \quad SO_3^- \quad \quad SO_3^- \\
 \\
 Al^{3+} \quad Al^{3+} \cdot nH_2O \\
 \\
 O^- \quad \quad O^- \quad \quad O^-
 \end{array}$$
- REACH registration number: 01-2119531538-36-0014
  - Chemical characterization: monoconstituant inorganic substance.

**1.2. Uses :**

**1.2.1. Relevant uses identification:**

Identified Uses (Nr. U.I)	Final Use Sector ( SU )	Preparation Category ( PC )	Process Category ( PROC )	Environment Release Category ( ERC )	Exposure Scenarios
1	8,9	N/A	1-4 ; 8b ; 15	1	1 : substance preparation
2	10	N/A	1 – 5 ; 8a ; 8b ; 9 ; 14 – 15 ; 19	2	2 : formulation and distribution
3	6b ; 8-9 ; 14	19 – 21 ; 26	1 – 4 ; 8a ; 8b ; 9 ; 15	1 – 2 ; 4 – 5 ; 6a ; 8a	3 : uses in synthesis and as an intermediary
4	5 ; 7 ; 6b	9a ; 19 – 21 ; 23 ; 26 ; 34 - 35	1 – 3 ; 5 ; 7 ; 8a ; 8b ; 9 ; 11 ; 19	3 – 5 ; 6a ; 6b ; 8a ; 8b ; 8c ; 8f ; 10a ; 11a .	4 : uses for spray production
5	1 ; 5 ; 6b ; 7 ; 13 ; 19	1 ; 9a ; 12 ; 19 – 21 ; 23 ; 26 ; 34 - 35	1 – 6 ; 8a ; 8b ; 9 – 10 ; 13 – 15 ; 19	2 – 5 ; 6a ; 6b ; 8a ; 8b ; 8 c ; 8f ; 10a ; 11 a .	5 : uses in non-spray production
6	2a ; 2b ; 5 ; 6b ; 10 ; 23	20 – 21 ; 37	2 – 5 ; 8a ; 8b ; 9 ; 19	2 ; 4 ; 6b ; 8a ; 8b ; 8d	6 : uses as flocculant/coagulant in water treatment
7	9	21	15	4	7 : uses in laboratories

Article Category – AC – N/A.

1.2.2. Not recommended uses: N/A

**1.3. Manufacturer identification:**

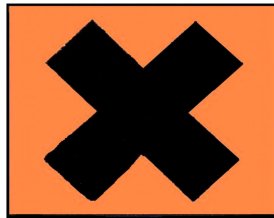
Manufacturer: **SC.ALSAL PROD SRL ORADEA**  
Headquarters: Str. George Enescu nr.16, ap.2 410034 Oradea, jud. Bihor, Romania  
Tel/fax: +40 259 434223  
Factory: str. Uzinelor nr.12, Oradea, jud. Bihor, Romania,  
tel. +40 359197457  
Contact person : ing. S. Ilie tel: +40356197457 cellphone +40770103740  
email : [contact@alsal.ro](mailto:contact@alsal.ro)  
Emergency telephone number: +40 744574991

**2. HAZARD IDENTIFICATION**

**2.1. Classification acc. Directive for dangerous substances (D67/548/EC-Annex 1 and HG 490 / 2002 – Annex 2)**

2.1.1. Hazards to human health

- a) Physical state: solid, hydrated form.  
Hazard symbol: Xi – irritant



**Xi - irritant**

Risk phrase: R<sub>41</sub> – Risk of serious damage to eyes

Safety phrases:

S<sub>22</sub> – Do not breathe dust

S<sub>26</sub> – In case of contact with eyes, rinse immediately with plenty of water and seek

medical advice

S<sub>28</sub> – After contact with skin, wash immediately with plenty of water

S<sub>37/39</sub> – Wear suitable gloves, Wear eye/face protection

- b) Physical state: liquid solution

Hazard Symbol: Xi – irritant

Risk phrases: R<sub>36/38</sub> - Irritating to eyes, Irritating to skin ( pH ≤ 2 )

Safety phrases :

S<sub>23</sub> – Do not breathe vapor

S<sub>26</sub> – In case of contact with eyes, rinse immediately with plenty of water and seek

medical advice

S<sub>28</sub> – After contact with skin, wash immediately with plenty of water

S<sub>37/39</sub> – Wear suitable gloves, Wear eye/face protection

2.1.2. Hazards to the environment: not classified

## 2.2. GHS/ CLP Classification (CE Ruling nr. 1272/2008 )

### 2.2.1 Hazards to human health

- a) Physical state: solid, hydrated form  
Hazard category: 1 – serious eye damage  
Warning word: danger (corrosive to eyes, category 1)  
GHS05 : corrosive



Hazard phrase: H<sub>318</sub> – Causes serious eye damage

Precautionary statements:

P<sub>261</sub> – Avoid breathing dust

P<sub>280</sub> – Wear protective gloves/protective clothing/eye protection/face protection

P<sub>305+351+338</sub> - IF IN EYES, rinse cautiously with water for several minutes, Remove contact lenses if present and easy to do. continue rinsing

P<sub>310</sub> - Immediately call a POISON CENTER or doctor/physician

P<sub>402</sub> –Store in a dry place

- b) Physical state: liquid solution  
Hazard category : 2 – irritant to eyes and skin  
Warning word: Warning (irritant to eyes category 2 and irritant to skin category 2 )  
GHS07: irritant



Hazard phrases: H<sub>319</sub> – Causes serious eye irritation

H<sub>315</sub> – Causes skin irritation

Precautionary phrases :

P<sub>264</sub> – Wash hands and face thoroughly after handling

P<sub>280</sub> – Wear protective gloves/protective clothing/eye protection/face protection

P<sub>305+351+338</sub> – if in eyes rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. continue rinsing

P<sub>337+313</sub> – If eye irritation persists: Get medical advice/attention

P<sub>302+352</sub> – If on skin wash with soap and water

P<sub>321</sub> – Specific treatment for eyes and skin: wash with 3% sodium bicarbonate

solution, then with plenty of water and apply sterile bandage  
P<sub>332+313</sub>- If skin irritation occurs: Get medical advice/attention  
P<sub>362</sub> – Take off contaminated clothing and wash before reuse  
P<sub>301+330+331</sub>- if swallowed rinse mouth, Do NOT induce vomiting  
P<sub>303+361+353</sub>- if on skin (or hair) remove/take off immediately all contaminated clothing,  
Rinse skin with water/shower  
P<sub>363</sub> – Wash contaminated clothing before reuse  
P<sub>304+340</sub>-IF INHALED: Remove victim to fresh air and keep at rest in a position  
comfortable for breathing  
P<sub>310</sub> – Immediately call a POISON CENTER or doctor/physician

2.2.2. Hazards to the environment: Not classified as hazardous to the environment (it hydrolyzes and settles quickly)

2.2.3. Hazards resulting from physical and chemical properties:

Danger category: 1 - can be corrosive to some metals

Hazards phrase: H<sub>290</sub> - May be corrosive to metals

Warning word: Warning

Precautionary statements:

P<sub>390</sub> – Collect spillage

P<sub>406</sub> – Store in a acid corrosive resistant platform (concrete)

2.2.4. It does not have potential PBT and VPVB

2.2.5. Hazard description

a) To human health:

- Causes serious eye damage on contact (tissue lesions or serious loss of eyesight after applying test substance on the front part of the eye – effects not reversible after 21 days). Symptoms: red eyes, strong burns.
- On prolonged skin contact causes skin irritation ( $\text{pH}_{\text{solution}} \leq 2$ ). Symptoms: skin reddening, itching.
- Swallowing causes corrosion on the digestive tract. Symptoms: burns, nausea.
- Dust or aerosol inhalation cause irritation of the nose and throat tissues. Symptoms: light itching, coughing.

b) To the environment:

- Environment degradation has not been determined for correct uses of the substance.

c) Resulting from the physical and chemical properties:

- May damage some metals through chemical reactions
- At temperatures higher than 600<sup>0</sup>C, SO<sub>3</sub> vapors are released through decomposition

d) Other hazards: none.

### 2.3. Labelling

a) Acc. CLP/GHS

- EC number: 233-135-0
- CAS number (from EC inventory) : 10043-01-3
- Trade name: ALUMINIUM SULFATE
- EC name: aluminium sulphate
- CAS name: sulfuric acid aluminium salt
- IUPAC name: aluminium sulfate
- Chemical formula: Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> .nH<sub>2</sub>O
- REACH Registration number: 01-2119531538-36-0014
- Manufacturer: **SC.ALSAL PROD SRL ORADEA**
- Headquarters: Str. George Enescu nr.16, ap.2 410034 Oradea, jud. Bihor, Romania, tel/fax: +40 259 434223
- Factory: str. Uzinelor nr.12, Oradea, jud. Bihor. tel. +40 359197457
- Contact person : ing. S. Ilie: tel. +40 359197457 cellphone +40770103740

email : [alsalprod@yahoo.com](mailto:alsalprod@yahoo.com)

Emergency number: +40 744574991

- Warning word: danger (corrosive to eye, category 1)

Danger pictogram: GHS05 : corrosive



- Danger Category: 1 – causes serious eye damage

- Hazard statements: H<sub>318</sub> – Causes serious eye damage

H<sub>290</sub> – May be corrosive to metals

- Precautionary statements :

P<sub>261</sub> – Avoid breathing dust

P<sub>264</sub> – Wash hands and face thoroughly after handling

P<sub>280</sub> – Wear protective gloves/protective clothing/eye protection/face protection

P<sub>310</sub> – Immediately call a POISON CENTER or doctor/physician

P<sub>305+351+338</sub> - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing

P<sub>406</sub> – Store on an acid corrosion resistant platform (concrete)

b) Acc.Directive 67/548/EEC

Symbol for hazard identification: Xi – irritant



**Xi - irritant**

Risk statement : R<sub>41</sub> - Risk of serious damage to eyes

Safety statement:

S<sub>22</sub> – Do not breathe dust

S<sub>26</sub> – In case of contact with eyes, rinse immediately with plenty of water and seek

medical advice

S<sub>28</sub> – After contact with skin, wash immediately with plenty of water

S<sub>37/39</sub> – Wear suitable gloves, Wear eye/face protection

### **3. COMPOSITION / INFORMATIONS REGARDING COMPONENTS (INGREDIENTS)**

#### **3.1. Identification information**

- Name: ALUMINIUM SULFATE
- Synonyms: aluminium salt of sulphuric acid, aluminium trisulphate, aluminium sulphate III, dialuminium trisulphate

#### **3.2. Components and concentration (Concentration domain)**

Substance type: monoconstituant:  $Al_2(SO_4)_3 \cdot nH_2O$

<b>Component name</b>	<b>Concentration interval , %</b>	<b>Nr. EINECS</b>	<b>Nr. CAS</b>	<b>Nr. REACH</b>
Aluminium sulfate octodecahydrate $Al_2(SO_4)_3 \cdot 18H_2O$	99,0 – 99,5	233-135-0	7784-31-8	
Aluminium Sulfate $Al_2(SO_4)_3$	50,8 – 51,1	233-135-0	10043-01-3	01-2119531538-36-0014
Water $H_2O$	48,2 – 48,4			
Sulphuric Acid $H_2SO_4$	0,15 – 0,42	231-639-5	7664-93-9	01-2119458838-20-0045
Aluminium hydroxide $Al(OH)_3$	0,10 – 0,40			01-2119529246-39-0021
Iron Fe	0,007 – 0,01			
Arsen As	$1,1 \times 10^{-4}$ - $8,1 \times 10^{-4}$			
Heavy metals: Cd, Cr, Hg, Ni, Pb, Sb, St	$1,1 \times 10^{-3}$ - $25 \times 10^{-3}$			
Other impurities	0,01 – 0,04			

The product does not contain other impurities which could influence the classification.

### **4. FIRST AID MEASURES**

#### **4.1. Description of the measures**

##### **4.1.1. Inhalation:**

- Immediately transport the worker to clean air
- Rinse mouth and nose with water
- If discomfort continues contact a doctor

##### **4.1.2. Eye contact:**

- Immediately rinse with lukewarm water
- Immediately take the worker to a doctor

##### **4.1.3. Skin contact:**

- Wash with plenty of water and soap. Apply dry sterile bandage.
- Remove and wash contaminated equipment before reuse.
- If discomfort continues contact a doctor

##### **4.1.4. Swallowing:**

- Immediately take the worker to a doctor
- Do NOT induce vomit
- Rinse mouth with water
- Drink 1 or 2 glasses of milk or water

- Do not administer anything to an unconscious person

**4.2.Symptoms:** see chapter 2.2.5

**4.3.Immediate medical assistance or special treatment:**

Insure water source for washing affected body parts (sink, shower).

Apply measures from chapters 4.1.1. - 4.1.4.

Important : if symptoms persist, for any body part, immediately take the affected worker to a doctor

## **5. FIRE-FIGHTING MEASURES**

### **5.1. Fire extinguishing methods**

- Use fire extinguishing methods applicable to the locale and environment
- Means not to be used: none
- Special equipment for firefighters: autonomous breathing equipment, fire protection equipment

**5. 2. Dangers caused by the substance:**possible SO<sub>3</sub>corrosive gas release at temperaturesover 600<sup>0</sup>C (substance decomposition). These gases are dangerous to breathing.

**5.3. Additional information:**apply standard fire fighting procedures for inorganic substances.

## **6. ACCIDENTAL RELEASE**

### **6.1. Precaution for workers**

- Observe protection measures in section 7
- Wear protection equipment and footwear
- Use a filter mask in case of dust, aerosols or fumes.

### **6.2. Precautions for environmental protection**

- Leaks: cover with absorbent materials (sand, bentonite, gravel)
- Lake or river contamination: inform the authorities
- Solid substances: collect and store in appropriate storage.

### **6.3. Cleaning methods**

- Use drainage pumps for massive leaks
- Use brooms and shovels for small leaks and residue
- Neutralize remaining residue with lime or limestone dust. Any residue must be disposed of according to national regulations

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## **7. HANDLING AND STORAGE**

### **7.1. Handling**

- Avoid contact with skin, eyes, mucous tissue
- Use latex gloves in accordance to manufacturer instructions referring to permeability and breakage time.
- Take into consideration specific locales such as cutting danger, abrasivity and time of contact.
- Use tight eyewear.

### **7.2. Storage**

- Store away from incompatible substances
- Store away from frost and humidity
- Avoid high temperatures
- Store in well ventilated places, on concrete surfaces
- Materials to avoid: alkaline, water, hypo chlorides, sulphides.
- As a liquid solution it reacts with the following metals: galvanized surfaces, aluminium, copper, zinc and their alloys.

### **7.3. Specific uses in drinking water treatment and waste water treatment**

- For handling and storage of the solid product follow chapters 7.1 and 7.2.
- The liquid solution is to be stored in recipients/pipes resistant to weak acids.

- Check seals before starting pumps.
- During circulation of the liquid solution workers have to wear anti-acid clothes, face masks and acid-resistant gloves.
- Follow the regulations from the relevant industrial sector of use.

## **8. EXPOSURE CONTROL**

### **8.1. Control parameters**

#### 8.1.1. Occupational exposure limit

Preparation of solution with max.52%  $Al_2(SO_4)_3$ :

$Al_2(SO_4)_3$  ( Nr.EC 233-135-0 ; Nr. CAS 10043-01-3) : LEO = 1,8 mg Al/m<sup>3</sup>air, long term exposure

Exposure source: preparation reactor emptying

Recommended exposure monitoring method: analysis of  $Al_3^+$  concentration in aerosols by taking samples during the entire emptying time (exposure)

Exposure frequency: 30 – 40 min./day/worker (5 days/week; 9 months/year)

#### 8.1.2. Biological limit

LBT = 200  $\mu g Al^{3+} / l$

#### 8.1.3. DNEL values

Exposure ways for workers

##### Skin contact:

- Systemic skin effect: not relevant
- Local acute effect -at pH < 2 the concentrated solution can be irritant, causes itching at pH > 2, the diluted solution does not have local or systemic toxicity. No additional testing is needed.
- System long-term effect: same
- Local long-term effect: same

Oral contact: not relevant for workers

Inhalation (aerosols present during batch preparation or dust present after cleaning storage facilities)

- Systemic acute effect: not relevant
- Local acute effect: not relevant
- Systemic long-term effect: DNEL=20,2mg/cubic meter air
- Long-term local effect: not relevant
- For the general population: -long-term systemic effect: -3,4 mg/Kg/day

#### 8.1.4. PNEC values

Exposure ways for the environment:

Aquatic compartment:

- In freshwater PNEC = 0,3  $\mu g / l Al^{3+}$  dissolved
- In saltwater PNEC = 0,3  $\mu g / l Al^{3+}$  dissolved
- sediments – Negligible risk because the presence of aluminium ions is very small and is pH- and organic
- material-dependent. The presence of the ion from the preparation area cannot be derived, nor is there any
- need to.

Terrestrial compartment: PNEC = 1 mg / kg at pH 3,4

Atmospheric compartment: there are no air emissions in salts. The aluminium ion concentration resulting from salts is negligible.

### **8.2. Worker exposure limits**

#### 8.2.1. Technical conditions:

- alternate workers from batch to batch during reactor emptying
- insure permanent ventilation of production facility
- monitoring of noxious levels has to be effected though chemical analysis by accredited



laboratories

- prepare an annual revision and repair program for all equipment
- prepare an operative plan for the prevention and management of emergency situations
- permanently provide a water source for washing (sinks, showers)
- prepare technical operating and maintenance procedures. Communicate procedures to workers. Test workers on knowledge of procedures, both theoretically and practically.
- provide protection equipment
- provide first-aid kit: burn spray, sterile bandages, 3% sodium bicarbonate solution

#### 8.2.2. Individual protection measures

For eyes and face: use protection screens. Do not use contact lenses.

For skin:

- hands
  - o use latex gloves, follow manufacturer instructions regarding permeability, breakage times. Take into consideration specific measures: cutting risks, abrasivity and contact time.
  - o pouring hot batches: use cotton gloves
- rest of the body: rubber boots, anti-acid overalls, rubber apron.

For breathing– use sealed masks during pouring of hot batches and cleaning storage areas.

#### 8.2.3. Hygiene measures

- the use of alcoholic beverages, smoking and eating are strictly forbidden
- before eating, drinking, smoking, using the lavatory, using cosmetic products and finishing work maintain good personal hygiene
- wash contaminated equipment before reuse
- do not use contact lenses

### 8.3.Environment exposure limits

#### 8.3.1. Technical measures:

- ensure permanent optimal functioning of drainage channels and vessels for recirculating used water in the production process
- ensure the existence chimney for cooling and dispersion for the aerosols from the production reactor vessel
- ensure the correct functioning of pipes, valves, flanges, seals and pumps for liquids

#### 8.3.2. Soil and water

- solid material or used waters containing chemical substances cannot leave the production or usage area. In case of accidental release the substance cannot reach surface waters, deep waters, gutters without previous neutralization (pH = 6.5 – 8) and dilution.
- recommended neutralization materials: diluted caustic soda solution or sodium carbonate. Acc. NTPA norm NTPA 002/2002 the limits for release in surface waters is max.5 mg Al<sup>3+</sup>/l and 600 mg SO<sub>4</sub>/l
- ensure storage in recipients made from appropriate materials ( PE, PP, PVC,OL 38 ) in good working order.

#### 8.3.3 Air – semestrial monitoring of emissions from the chimney of the production reactor.

## **9. PHYSICAL AND CHEMICAL PROPERTIES**

- aspect : white blocks; white flakes, ground and powder; clear colorless solution
- smell: none
- physical state solid ( at 20<sup>0</sup>C and 101,3 Kpa ) or liquid solution with max. 25% Al
- decomposition point: 650 – 770<sup>0</sup>C
- melting point: 86<sup>0</sup>C
- combustion point: does not burn
- inflammability : not flammable

- evaporation speed in solid state: N/A
- vapor pressure in solid state: N/A
- explosive characteristics: not explosive
- oxidizing characteristics: not oxidizing
- density in solid: anhydrous 2,71, hydrated solid with 18 H<sub>2</sub>O 1,6 – 1,7 at 25 °C
- density in solution: depends on concentration and temperature
- water solubility is dependent on temperature: 100 ml water at 25°C dissolves 28 g Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>
- n octanol/water partition coefficient: N/A
- pH solution 10 g/l , at 20°C – 3,5
- reacts with alkalis, hydrolyses
- 

## **10. STABILITY AND REACTIVITY**

**10.1. Reactivity:** it has the properties of a salt with acid hydrolysis

**10.2. Stability :** long term chemically stable, in correct handling and storage conditions

**10.3. Possibility of dangerous reactions:** N/A

**10.4. Conditions to avoid:**moisture, freezing, storing on metal surfaces, contamination with incompatible substances (chapter 10.5), proximity to heat sources or flames

**10.5. Materials to avoid:** contact with water, alkalis, hypo chlorides, sulphides, moist metal surfaces (galvanized metal, aluminium, copper, zinc and their alloys)

**10.6. Dangerous decomposition compounds:** in case of fire it can release corrosive sulphur trioxide vapors over 600°C.

## **11. TOXICOLOGICAL INFORMATION**

### **11.1. Toxicological effects on health**

11.1.1. Acute toxicity:

LD<sub>50</sub>rat,oral – 2000 mg Al dissolved/kg body weight

LD<sub>50</sub> rat,dermal – 5000 mg Al dissolved/kg body weight

LC<sub>50</sub> rat,inhalation – 5000 mg Al/m<sup>3</sup> air

11.1.2. Irritation

For skin: - solution with pH > 2 – not irritant

-solution with pH < 2 – irritant cat. 2

For eyes:solution with pH>2 – irritant cat. 2A

For respiratory tract (solid form and solution at room temperature): N/A

11.1.3. Corrosivity: for the solid states, with concentration > 50 % Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> or solutions with pH < 2 – corrosive for the eyes cat.1

11.1.4. Sensibilisation: does not have sensibilisation effects

11.1.5. Toxicity for repeated doses

LD<sub>50</sub>rat,oral (90 days) < 50 mg/kg body weight

LD<sub>50</sub>rat,oral (1 year) < 25 mg/kg body weight

LOAEC rat,inhalation – 15.3 mg/m<sup>3</sup> air

dermal : small absorption rates through the skin studies not scientifically justified

11.1.6. Mutagenity: does not have mutagenic properties

11.1.7. Cancerigenity : no relevant data exist

11.1.8. Toxicity for reproduction: does not have a toxic effect on reproduction

11.1.9. Toxicokinetics (absorption, metabolism, distribution, elimination): not relevant, does not have bioaccumulative potential

11.1.10. STOS unique exposure: no effects identified on animals

11.1.11. STOS repeated exposure:no effects identified on animals

11.1.12. Neurotoxicity : NOAEL (baby rats) : 30 mgAl<sup>3+</sup>/kg body/day–neuromuscular effect

**11. 2. Effects caused by the physical and chemical characteristics:** does not have explosive, oxidant, flammable, self combusting, smelling properties

**11.3. Interactive effects:** none

**11.4. Symptoms for exposure ways:** see chapter.2.2.5.

## **12. EXOTOXICOLOGICAL INFORMATION**

### **12.1. Toxicity**

#### 12.1.1. Aquatic compartment

– fish : LC<sub>50</sub> ( Danio rerio, 96h, ) > 1000 mg/l

NOEC ( Danio rerio, 96h ) > 1000 mg/l

EC<sub>50</sub> ( Daphnia, 48 h ) > 160 mg/l

– algae : IC<sub>50</sub> ( 72 h ) – N/A

Testing conditions : solution with pH 3,5 ( 10g/l and 20°C ).

There is no data available for other water organisms. Aluminium salts are relatively non-toxic in the majority of waters with a neutral pH; they hydrolyse and deposit fast.

#### 12.1.2. Terrestrial compartment

Aluminium is a common element (inorganic product) which represents 8% of the Earth's crust. The concentration varies naturally between 1 – 30% in the soil.

Aluminium toxicity is associated with its soluble compounds, but aluminium salts do not accumulate in the soil. Aluminium salts hydrolyze and deposit fast, through dilution.

Toxic effect for terrestrial organisms is negligible.

#### 12.1.3. Atmospheric compartment

Soluble aluminium salts do not accumulate in the atmosphere.

**Conclusion :** Aluminium salts are relatively non-toxic in the three natural compartments.

### **12.2. Persistence and biodegradability**

The concept of biodegradability is not applicable to inorganic salts in general. Abundant aluminium can be found as minerals in nature.

### **12.3. Bioaccumulation potential**

Soluble aluminium salts do not have bioconcentration potential, they have biodilution potential. Thus they do not have bioaccumulation potential in the food chain.

**12.4. Mobility in soil:** hydrolyses and deposits fast.

### **12.5. PBT and VPVB potential**

The results of the studies do not lead to characterization of aluminium sulfate as PBT and VPVB.

**12.6. Other adverse effects:** not known

## **13. ELIMINATION CONSIDERATIONS**

Waste code : 060314 – inorganic salts; handling acc. OUG 78/2000 regarding waste materials, approved and modified by L 426/2001, modified and completed by OUG 61/2006 approved by L 27/2007 .

Waste monitoring in accordance with HG. nr. 856/2002.

Solid wastes from the production platform are recycled in the production process: they are dissolved in water in a tank and the resulting solution, after decanting, is reintroduced in the production reactor.

Residual solutions from the production platform are collected in a channel, then decanted and recirculated in the production process. The sludge is washed and decanted up to pH 6-8, collected in recipients and released in the waste water system.

Solid wastes resulting in other places than the production facility are deposited in closed recipients made of PVC, PP, PE for later removal by authorized companies.

Residual solutions resulted from accidental releases are treated according to chapter 8.3.2.

## **14. INFORMATION REGARDING TRANSPORT**

**14.1. RID ; ADR ; IMDG ; IATA :** not applicable

**14.2. UN number, danger class, packing class:** not applicable

**14.3. Environmental hazards:** the product is not classified as dangerous to the environment

**14.4. Special precautions for end-users:** none

**14.5. Bulk transport:** as blocks – with covered dump truck or covered train car; as granules, powder and liquid – truck silo. Transport means will comply with national and international regulations.

## **15. REGULATORY INFORMATION**

The product is classified as dangerous to human health through its chemical and physical properties – it can be corrosive to certain metals.

ALSAL PROD SRL makes available a Chemical Security Report upon request.

Aluminium sulfate is not a SEVESO substance, it does not affect the ozone layer and is not a persistent pollution agent.

There are no usage restrictions.

### **15.1. Classification:**

- Acc. Directive 67/548/EC : R<sub>41</sub> –Risk of serious damage to eyes
- Acc. GHS/CLP : hydrated solid form: H<sub>318</sub> – Causes serious eye damage
- : solution: H<sub>319</sub> –Causes serious eye irritation
- H<sub>315</sub> – Causes skin irritation at pH ≤ 2

Details in chapter 2.

### **15.2. Regulations for human health and the environment**

- RegulationEC nr. 1272/2008 CLP, modified by RegulationEC nr. 453/2010
- RegulationEC nr. 1907/2006 ( REACH )
- OUG nr. 152/2005 regarding integrated pollution control and prevention approved by L.nr.84/2006.
- HG.nr.856/2002 regarding waste management and approving the waste materials list, including dangerous waste
- Integrated Environment Authorization nr. 44-NV6 / 18.12.2006 revised on 20.10.2008.
- Directive CE nr. 67/548/EC
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## **16. OTHER INFORMATION**

**16.1. The list of R phrases, danger statements, security relevant information** are described in Chapter 2.

### **16.2. Recommendations regarding personnel training:**

- Personnel responsible with occupational hazards and environmental protection from the entities producing/using aluminium sulfate have to be instructed in the applicable laws and regulations (chapter 15.2), this MSDS; they have to relay to their subordinates all the necessary information
- We do not recommend any restrictions to the uses of aluminium sulfate, if the present MSDS and the regulations in chapter 15.2 are observed.
- The most important information sources used in the elaboration of this MSDS are: RSC for the aluminium sulfate, regulations at chapter 15.2, the IEA of S.C. Alsal Prod nr. 44-NV6 / 18.12.2006 revised on 20.10.2008.

### **16.3. Abbreviations**

EC – European Commission  
IEA – Integrated Environment Authorization  
EINECS – European Inventory of Existing Commercial chemical Substances  
CAS – Chemical Abstracts Service  
GHS – Global Harmonized System  
CLP – Classification, Labelling Packaging  
MSDS – Material Data Safety Sheet  
SU – Use Sector

PC – Product Category  
PROC – Process Category  
ERC – Environment Release Category  
PNEC – Predicted No Effect Concentration  
DNEL – Derived No Effect Level  
PBT – Persistent Bioaccumulative Toxic  
VPVB – Very Persistent, Very Bioaccumulative  
LC<sub>50</sub> -Lethal Concentration 50 (concentration in water having 50% chance of causing death to aquatic life)  
LD<sub>50</sub> – Lethal Dose 50 (median concentration of a toxicant that will kill 50% of the test animals within a designated period)  
NOEC – No Observed Effect Concentration  
NOAEL – No-Observed-Adverse-Effect Level  
LOAEC – Lowest Observable Adverse Effect Concentration

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The content of this MSDS comply with Title 4, Art.31 from Regulation EC nr. 1907/2006(REACH) and RegulationEC. nr. 453/2010-Annex 1, Regulation 1272/2008 ( CLP ) .

The information in this MSDS are presented for the risks involved with production/handling/storage/usage of aluminium sulfate. They do not represent information regarding product quality.Please request a Technical Data Sheet for this product for buying and processing.