

SAFETY DATA SHEET

(in accordance with Regulation (EU) 2020/878)



G0040-codasul pH

Version 1 Date of compilation: 27/03/2020

Version 4 (replaces version 3)

Revision date: 02/08/2023

Page 1 of 9

Print date: 02/08/2023

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

1.1 Product identifier.

Product Name: codasul pH
Product Code: G0040
UFI: UXM0-A0E0-Y000-95U5

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

SU1. Agriculture (Fertilizer). For professional use only.

Uses advised against:

Uses other than those recommended.

1.3 Details of the supplier of the safety data sheet.

Company: **Sustainable Agro Solutions, S.A.U.**
Address: Ctra. N-240, Km. 110
City: Almacelles
Province: Lleida
Telephone: 973 74 04 00
Fax: 973 74 14 89
E-mail: info@sas-agri.com
Web: www.sas-agri.com

1.4 Emergency telephone number: 973 74 04 00 (Only available during office hours; Monday-Friday; 08:00-18:00)

SECTION 2: HAZARDS IDENTIFICATION.

2.1 Classification of the substance or mixture.

In accordance with Regulation (EC) No 1272/2008:

Eye Dam. 1 : Causes serious eye damage.

Skin Corr. 1 : Causes severe skin burns and eye damage.

2.2 Label elements.

Labelling in accordance with Regulation (EC) No 1272/2008:

Pictograms:



Signal Word:

Danger

Hazard statements:

H314 Causes severe skin burns and eye damage.

Precautionary statements:

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P264 Wash hands thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

-Continued on next page.-

SAFETY DATA SHEET

(in accordance with Regulation (EU) 2020/878)



G0040-codasul pH

Version 1 Date of compilation: 27/03/2020

Version 4 (replaces version 3)

Revision date: 02/08/2023

Page 2 of 9

Print date: 02/08/2023

P310 Immediately call a POISON CENTER/doctor/...

Contains:
uronium hydrogen sulphate

2.3 Other hazards.

The mixture does not contain substances classified as PBT.
The mixture does not contain substances classified as vPvB.
The mixture does not contain any endocrine disrupting properties substances.

In normal use conditions and in its original form, the product itself does not involve any other risk for health and the environment.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS.

3.1 Substances.

Not applicable.

3.2 Mixtures.

Substances posing a danger to health or the environment in accordance with the Regulation (EC) No. 1272/2008, assigned a Community exposure limit in the workplace, and classified as PBT/vPvB or included in the Candidate List:

Identifiers	Name	Concentrate	(*)Classification - Regulation (EC) No 1272/2008	
			Classification	Specifics concentration limits and Acute toxicity estimate
CAS No: 21351-39-3 EC No: 244-343-6 Registration No: 01-2119782904-26-XXXX	uronium hydrogen sulphate	3 - 100 %	Eye Dam. 1, H318	-
Index No: 026-003-01-4 CAS No: 7782-63-0 EC No: 231-753-5	iron (II) sulfate (1:1) heptahydrate, sulfuric acid, iron(II) salt (1:1), heptahydrate, ferrous sulfate heptahydrate	0 - 10 %	Acute Tox. 4 *, H302 - Eye Irrit. 2, H319 - Skin Irrit. 2, H315	Skin Irrit. 2, H315: C ≥ 25 %

(*) The complete text of the H phrases is given in section 16 of this Safety Data Sheet.

* See Regulation (EC) No. 1272/2008, Annex VI, section 1.2.

SECTION 4: FIRST AID MEASURES.

4.1 Description of first aid measures.

In case of doubt or when symptoms of feeling unwell persist, get medical attention. Never administer anything orally to persons who are unconscious.

Inhalation.

Take the victim into open air; keep them warm and calm. If breathing is irregular or stops, perform artificial respiration.

Eye contact.

Wash eyes with plenty of clean and cool water for at least 10 minutes while pulling eyelids up, and seek medical assistance. Don't let the person to rub the affected eye.

Skin contact.

Remove contaminated clothing. Wash skin vigorously with water and soap or a suitable skin cleaner. NEVER use solvents or thinners.

Ingestion.

If accidentally ingested, seek immediate medical attention. Keep calm. NEVER induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed.

-Continued on next page.-

SAFETY DATA SHEET

(in accordance with Regulation (EU) 2020/878)



G0040-codasul pH

Version 1 Date of compilation: 27/03/2020

Version 4 (replaces version 3)

Revision date: 02/08/2023

Page 3 of 9

Print date: 02/08/2023

Corrosive Product, contact with eyes or skin can cause burns; ingestion or inhalation can cause internal damage, if this occurs immediate medical assistance is required.

Contact with eyes may cause irreversible damage.

4.3 Indication of any immediate medical attention and special treatment needed.

Request immediate medical attention. Never administer anything orally to persons who are unconscious. Do not induce vomiting. If the person vomits, clear the respiratory tract. Cover the affected area with a dry sterile bandage. Protect the affected area from pressure or friction.

SECTION 5: FIREFIGHTING MEASURES.

The product is NOT classified as flammable, in case of fire the following measures should be taken:

5.1 Extinguishing media.

Suitable extinguishing media:

Extinguisher powder or CO₂. In case of more serious fires, also alcohol-resistant foam and water spray.

Unsuitable extinguishing media:

Do not use a direct stream of water to extinguish. In the presence of electrical voltage, you cannot use water or foam as extinguishing media.

5.2 Special hazards arising from the substance or mixture.

Special risks.

Exposure to combustion or decomposition products can be harmful to your health.

5.3 Advice for firefighters.

Use water to cool tanks, cisterns, or containers close to the heat source or fire. Take wind direction into account. Prevent the products used to fight the fire from going into drains, sewers, or waterways.

Fire protection equipment.

According to the size of the fire, it may be necessary to use protective suits against the heat, individual breathing equipment, gloves, protective goggles or facemasks, and boots.

SECTION 6: ACCIDENTAL RELEASE MEASURES.

6.1 Personal precautions, protective equipment and emergency procedures.

For exposure control and individual protection measures, see section 8.

6.2 Environmental precautions.

Product not classified as hazardous for the environment, avoid spillage as much as possible.

6.3 Methods and material for containment and cleaning up.

Contain and collect spillage with inert absorbent material (earth, sand, vermiculite, Kieselguhr...) and clean the area immediately with a suitable decontaminant.

Deposit waste in closed and suitable containers for disposal, in compliance with local and national regulations (see section 13).

6.4 Reference to other sections.

For exposure control and individual protection measures, see section 8.

For later elimination of waste, follow the recommendations under section 13.

SECTION 7: HANDLING AND STORAGE.

7.1 Precautions for safe handling.

For personal protection, see section 8.

In the application area, smoking, eating, and drinking must be prohibited.

Follow legislation on occupational health and safety.

-Continued on next page.-

SAFETY DATA SHEET

(in accordance with Regulation (EU) 2020/878)



G0040-codasul pH

Version 1 Date of compilation: 27/03/2020

Version 4 (replaces version 3)

Revision date: 02/08/2023

Page 4 of 9

Print date: 02/08/2023

Never use pressure to empty the containers. They are not pressure-resistant containers. Keep the product in containers made of a material identical to the original.

7.2 Conditions for safe storage, including any incompatibilities.

Store according to local legislation. Observe indications on the label. Store the containers between 5 and 25 ° C, in a dry and well-ventilated place, far from sources of heat and direct solar light. Keep far away from ignition points. Keep away from oxidising agents and from highly acidic or alkaline materials. Do not smoke. Prevent the entry of non-authorised persons. Once the containers are open, they must be carefully closed and placed vertically to prevent spills.

The product is not affected by Directive 2012/18/EU (SEVESO III).

7.3 Specific end use(s).

Agricultural

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION.

8.1 Control parameters.

The product does NOT contain substances with Professional Exposure Environmental Limit Values. The product does NOT contain substances with Biological Limit Values.

Concentration levels DNEL/DMEL:

Name	DNEL/DMEL	Type	Value
uronium hydrogen sulphate CAS No: 21351-39-3 EC No: 244-343-6	DNEL (Workers)	Inhalation, Chronic, Systemic effects	2,697 (mg/m ³)

DNEL: Derived No Effect Level, level of exposure to the substance below which adverse effects are not anticipated.

DMEL: Derived Minimal Effect Level, exposure level corresponding to a low risk, that risk should be considered a tolerable minimum.

8.2 Exposure controls.

Measures of a technical nature:

Provide adequate ventilation, which can be achieved by using good local exhaust-ventilation and a good general exhaust system.

Concentration:	100 %	
Uses:	SU1. Agriculture (Fertilizer). For professional use only.	
Breathing protection:		
PPE:	Filter mask for protection against gases and particles.	
Characteristics:	«CE» marking, category III. The mask must have a wide field of vision and an anatomically designed form in order to be sealed and watertight.	
CEN standards:	EN 136, EN 140, EN 405	
Maintenance:	Should not be stored in places exposed to high temperatures and damp environments before use. Special attention should be paid to the state of the inhalation and exhalation valves in the face adaptor.	
Observations:	Read carefully the manufacturer's instructions regarding the equipment's use and maintenance. Attach the necessary filters to the equipment according to the specific nature of the risk (Particles and aerosols: P1-P2-P3, Gases and vapours: A-B-E-K-AX), changing them as advised by the manufacturer.	
Filter Type needed:	A2	
Hand protection:		
PPE:	Non-disposable protective gloves against chemicals.	
Characteristics:	«CE» marking, category III. Check the list of chemicals for which the glove has been tested.	
CEN standards:	EN 374-1, EN 374-2, EN 374-3, EN 420	
Maintenance:	A schedule for the periodical replacement of gloves should be established in order to guarantee their replacement before pollutants permeate them. The use of contaminated gloves could be more dangerous than not using gloves, since the pollutant can gradually accumulate in the glove's material.	
Observations:	They are to be replaced whenever tears, cracks or deformations are observed or when exterior dirt could reduce their strength.	

-Continued on next page.-

SAFETY DATA SHEET

(in accordance with Regulation (EU) 2020/878)

G0040-codasul pH






Version 1 Date of compilation: 27/03/2020

Version 4 (replaces version 3)

Revision date: 02/08/2023

Page 5 of 9

Print date: 02/08/2023

Material:	PVC (polyvinyl chloride)	Breakthrough time (min.):	> 480	Material thickness (mm):	0,35
Eye protection:					
PPE:	Protective goggles with built-in frame.				
Characteristics:	«CE» marking, category II. Eye protector with built-in frame for protection against dust, smoke, fog and vapour.				
CEN standards:	EN 165, EN 166, EN 167, EN 168				
Maintenance:	Visibility through lenses should be ideal. Therefore, these parts should be cleaned daily. Protectors should be disinfected periodically following the manufacturer's instructions.				
Observations:	Some signs of wear and tear include: yellow colouring of the lenses, superficial scratching of the lenses, scraping etc.				
Skin protection:					
PPE:	Chemical protective clothing				
Characteristics:	«CE» marking, category III. Clothing should fit properly. The level of protection must be set according to a test parameter called BT (Breakthrough Time), which indicates how long it takes for the chemical to pass through the material.				
CEN standards:	EN 464, EN 340, EN 943-1, EN 943-2, EN ISO 6529, EN ISO 6530, EN 13034				
Maintenance:	In order to guarantee uniform protection, follow the washing and maintenance instructions provided by the manufacturer.				
Observations:	The protective clothing's design should facilitate correct positioning, staying in place without moving for the period of use expected, bearing in mind environmental factors as well as any movement or position the user might adopt while carrying out the activity.				
PPE:	Anti-static safety footwear against chemicals.				
Characteristics:	«CE» marking, category III. Check the list of chemicals against which the footwear is resistant.				
CEN standards:	EN ISO 13287, EN 13832-1, EN 13832-2, EN 13832-3, EN ISO 20344, EN ISO 20345				
Maintenance:	For correct maintenance of this kind of safety footwear, it is necessary to observe the instructions specified by the manufacturer. The footwear should be replaced as soon as any sign of damage is observed.				
Observations:	The footwear should be cleaned regularly and dried when damp, although it should not be placed too close to a source of heat in order to avoid any sharp changes in temperature.				

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES.

9.1 Information on basic physical and chemical properties.

Physical state: Liquid

Colour: light orange

Odour: Odourless

Odour threshold: Not available

Melting point: Not applicable

Freezing point: < 0 °C

Boiling point or initial boiling point and boiling range: Not available

Flammability: Not applicable

Lower explosion limit: Not applicable

Upper explosion limit: Not applicable

Flash point: Not applicable

Auto-ignition temperature: Not applicable

Decomposition temperature: Not available

pH: 1.4 (100%)

Kinematic viscosity: Not available

Solubility: soluble in water

Hydrosolubility: completely soluble

Liposolubility: insoluble

Partition coefficient n-octanol/water (log value): Not applicable

Vapour pressure: Not available

Absolute density: Not available

Relative density: 1,52 g/ml

Relative vapour density: Not available

Particle characteristics: Not applicable

-Continued on next page.-

SAFETY DATA SHEET

(in accordance with Regulation (EU) 2020/878)



G0040-codasul pH

Version 1 Date of compilation: 27/03/2020

Version 4 (replaces version 3)

Revision date: 02/08/2023

Page 6 of 9

Print date: 02/08/2023

9.2 Other information

Not applicable/Not available due to the nature/properties of the product

SECTION 10: STABILITY AND REACTIVITY.

10.1 Reactivity.

The product does not present hazards by their reactivity.

10.2 Chemical stability.

Stable under the recommended handling and storage conditions (see section 7).

10.3 Possibility of hazardous reactions.

The product does not present possibility of hazardous reactions.

10.4 Conditions to avoid.

Avoid any improper handling.

10.5 Incompatible materials.

Keep away from oxidising agents and from highly alkaline or acidic materials in order to prevent exothermic reactions.

10.6 Hazardous decomposition products.

No decomposition if used for the intended uses.

SECTION 11: TOXICOLOGICAL INFORMATION.

11.1 Information on hazard classes as defined in Regulation (EC) N° 1272/2008.

There are no tested data available on the product.

Splatters in the eyes can cause irritation and reversible damage.

a) acute toxicity;

Not conclusive data for classification.

b) skin corrosion/irritation;

Product classified:

Skin Corrosive, Category 1: Causes severe skin burns and eye damage.

c) serious eye damage/irritation;

Product classified:

Serious eye damage, Category 1: Causes serious eye damage.

d) respiratory or skin sensitisation;

Not conclusive data for classification.

e) germ cell mutagenicity;

Not conclusive data for classification.

f) carcinogenicity;

Not conclusive data for classification.

g) reproductive toxicity;

Not conclusive data for classification.

h) STOT-single exposure;

Not conclusive data for classification.

i) STOT-repeated exposure;

Not conclusive data for classification.

j) aspiration hazard;

-Continued on next page.-

SAFETY DATA SHEET

(in accordance with Regulation (EU) 2020/878)



G0040-codasul pH

Version 1 Date of compilation: 27/03/2020

Version 4 (replaces version 3)

Revision date: 02/08/2023

Page 7 of 9

Print date: 02/08/2023

Not conclusive data for classification.

11.2 Information on other hazards.

Endocrine disrupting properties

This product does not contain components with endocrine-disrupting properties with effects on human health.

Other information

There is no information available on other adverse health effects.

SECTION 12: ECOLOGICAL INFORMATION.

12.1 Toxicity.

No information is available regarding the ecotoxicity of the substances present.

12.2 Persistence and degradability.

No information is available regarding the biodegradability of the substances present.

No information is available on the degradability of the substances present.

No information is available about persistence and degradability of the product.

12.3 Bioaccumulative potential.

No information is available regarding the bioaccumulation of the substances present.

12.4 Mobility in soil.

No information is available about the mobility in soil.

The product must not be allowed to go into sewers or waterways.

Prevent penetration into the ground.

12.5 Results of PBT and vPvB assessment.

No information is available about the results of PBT and vPvB assessment of the product.

12.6 Endocrine disrupting properties.

This product doesn't contain components with environmental endocrine disrupting properties.

12.7 Other adverse effects.

The product is not affected by the Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer.

No information is available about other adverse effects for the environment.

SECTION 13: DISPOSAL CONSIDERATIONS.

13.1 Waste treatment methods.

Do not dump into sewers or waterways. Waste and empty containers must be handled and eliminated according to current, local/national legislation.

Follow the provisions of Directive 2008/98/EC regarding waste management.

SECTION 14: TRANSPORT INFORMATION.

Transport following ADR rules for road transport, RID rules for railway, ADN for inner waterways, IMDG for sea, and ICAO/IATA for air transport.

Land: Transport by road: ADR, Transport by rail: RID.

Transport documentation: Consignment note and written instructions

Sea: Transport by ship: IMDG.

Transport documentation: Bill of lading

Air: Transport by plane: ICAO/IATA.

Transport document: Airway bill.

-Continued on next page.-

SAFETY DATA SHEET

(in accordance with Regulation (EU) 2020/878)



G0040-codasul pH

Version 1 Date of compilation: 27/03/2020

Version 4 (replaces version 3)

Revision date: 02/08/2023

Page 8 of 9

Print date: 02/08/2023

14.1 UN number or ID number.

UN No: UN1760

14.2 UN proper shipping name.

Description:

ADR/RID: UN 1760, CORROSIVE LIQUID, N.O.S., 8, PG III, (E)

IMDG: UN 1760, CORROSIVE LIQUID, N.O.S., 8, PG III

ICAO/IATA: UN 1760, CORROSIVE LIQUID, N.O.S., 8, PG III

14.3 Transport hazard class(es).

Class(es): 8

14.4 Packing group.

Packing group: III

14.5 Environmental hazards.

Marine pollutant: No

Transport by ship, FEm – Emergency sheets (F – Fire, S - Spills): F-A,S-B

14.6 Special precautions for user.

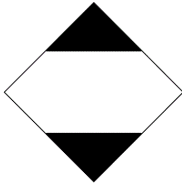
Provisions concerning carriage in bulk ADR: Not authorized carriage in bulk in accordance with ADR.

Proceed in accordance with point 6.

ADR LQ: 5 L

IMDG LQ: 5 L

ICAO LQ: 1 L



14.7 Maritime transport in bulk according to IMO instruments.

The product is not transported in bulk.

SECTION 15: REGULATORY INFORMATION.

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

The product is not affected by Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products.

The product is not affected by the procedure established Regulation (EU) No 649/2012, concerning the export and import of dangerous chemicals.

15.2 Chemical safety assessment.

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: OTHER INFORMATION.

Complete text of the H phrases that appear in section 3:

H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.

-Continued on next page.-

SAFETY DATA SHEET

(in accordance with Regulation (EU) 2020/878)



G0040-codasul pH

Version 1 **Date of compilation: 27/03/2020**

Version 4 (replaces version 3)

Revision date: 02/08/2023

Page 9 of 9

Print date: 02/08/2023

Classification codes:

Acute Tox. 4 : Acute toxicity (Oral), Category 4
Eye Dam. 1 : Serious eye damage, Category 1
Eye Irrit. 2 : Eye irritation, Category 2
Skin Corr. 1 : Skin Corrosive, Category 1
Skin Irrit. 2 : Skin irritant, Category 2

Changes regarding to the previous version:

- Changes in the composition of the product (SECTION 3.2).
- Modification of the information of the stability and reactivity conditions (SECTION 10.2).
- Modification of the information of the stability and reactivity conditions (SECTION 10.3).
- Modification of the information of the stability and reactivity conditions (SECTION 10.4).
- Modification of the information of the stability and reactivity conditions (SECTION 10.5).
- Modification of the information of the stability and reactivity conditions (SECTION 10.6).

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Physical hazards	On basis of test data
Health hazards	Calculation method
Environmental hazards	Calculation method

It is advisable to carry out basic training with regard to health and safety at work in order to handle this product correctly.

Available Product Exposure Scenario.

Abbreviations and acronyms used:

ADR/RID: Agreement concerning the International Carriage of Dangerous Goods by Road.

CEN: European Committee for Standardization.

DMEL: Derived Minimal Effect Level, exposure level corresponding to a low risk, that risk should be considered a tolerable minimum.

DNEL: Derived No Effect Level, level of exposure to the substance below which adverse effects are not anticipated.

PPE: Personal protection equipment.

IATA: International Air Transport Association.

ICAO: International Civil Aviation Organization.

IMDG: International Maritime Code for Dangerous Goods.

RID: Regulations Concerning the International Transport of Dangerous Goods by Rail.

Key literature references and sources for data:

<http://eur-lex.europa.eu/homepage.html>

<http://echa.europa.eu/>

Regulation (EU) 2020/878.

Regulation (EC) No 1907/2006.

Regulation (EC) No 1272/2008.

The information given in this Safety Data Sheet has been drafted in accordance with COMMISSION REGULATION (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemical substances and mixtures (REACH).

The information in this Safety Data Sheet on the Preparation is based on current knowledge and on current EC and national laws, as far as the working conditions of the users is beyond our knowledge and control. The product must not be used for purposes other than those that are specified without first having written instructions on how to handle. It is always the responsibility of the user to take the appropriate measures in order to comply with the requirements established by current legislation. The information contained in this Safety Sheet only states a description of the safety requirements for the preparation, and it must not be considered as a guarantee of its properties.

9.0. General information

9.0.1. Overview

9.0.1.1. Overview of exposure scenarios

EC number:
244-343-6

Uronium hydrogen sulphate

CAS number:
21351-39-3

Table 40. Overview of exposure scenarios (ES) described in sections 9.1ff.

ES number	Exposure scenario name	Manufacture / Use / Subsequent service life	Stage No.*)
1	Manufacturing of fertilizers, including maintenance or cleaning	Manufacturing of fertilizers, including maintenance or cleaning - Process during manufacturing (PROC 1) - Process during manufacturing (PROC 4)	M-1
2	Formulation stage: Formulation of preparations and/or re-packing	Formulation stage: Formulation of preparations and/or re-packing - Use related to formulation: Handling and packaging of fertilizers (PROC 8b) - Use related to formulation: Handling and packaging of fertilizers (PROC 9)	F-1
3	Professional end-use stage: Wide dispersive use (outdoor)	Professional end-use stage: Wide dispersive use (outdoor) - Professional use: wide dispersive use outdoor (PROC 8a)	PW-1
4	Professional end-use stage: Wide dispersive use (indoor)	Professional end-use stage: Wide dispersive use (indoor) - Professional use: non dispersive use (PROC 8b)	PW-2
5	Professional end-use stage: non dispersive use (outdoor)	Professional end-use stage: non dispersive use (outdoor) - Professional use: non dispersive use (PROC 2)	PW-3
*) Consecutive numbers of each stage; no unique ID numbers.			
Manufacture: M-#, Formulation: F-#, Industrial end use: IW-#, Professional end use: PW-#, Consumer end use: C-#, Service life (by workers in industrial settings): SL-IW-#, Service life (by professional workers): SL-PW-#, Service life (by consumers): SL-C-#.			

EC number:
244-343-6

Uronium hydrogen sulphate

CAS number:
21351-39-3

9.0.1.2. Overview of uses

Table 41. Overview of uses broken down by life cycle stages and the exposure scenarios (ES) described in sections 9.1ff.

Main life cycle stage	Stage No. *)	Manufacture / Use / Subsequent service life	Related subsequent service life	Market sector	Tonnage (tonnes per year)	ES No.
		Manufacture of uronium hydrogen sulphate			>1000**	
Manufacturing	M-1	Manufacturing of fertilizers, including maintenance or cleaning (ERC 1) - Process during manufacturing (PROC 1) - Process during manufacturing (PROC 4)			>1000**	1
		Market Sector:fertiliser			0**	
Formulation	F-1 (IUC-1001)	Formulation stage: Formulation of preparations and/or re-packing (ERC 2)			>10**	2
Professional workers uses	PW-1 (IUC-1)	Professional end-use stage: Wide dispersive use (outdoor) (ERC 8e) - Professional use: wide dispersive use outdoor (PROC 8a)			>1**	3
Professional workers uses	PW-2 (IUC-2)	Professional end-use stage: Wide dispersive use (indoor) (ERC 8b) - Professional use: non dispersive use (PROC 8b)			>1**	4
Professional workers uses	PW-3 (IUC-3)	Professional end-use stage: non dispersive use (outdoor) (ERC 9b) - Professional use: non dispersive use (PROC 2)			>1**	5
<p>*) Consecutive numbers of each stage; no unique ID numbers.</p> <p>***) The Risk Assessment has been performed taking into account exact values.</p> <p>Manufacture: M-#, Formulation: F-#, Industrial end use: IW-#, Professional end use: PW-#, Consumer end use: C-#, Service life (by workers in industrial settings): SL-IW-#, Service life (by professional workers): SL-PW-#, Service life (by consumers): SL-C-#.</p> <p>In IUCLID section 3.5 the numbering of identified uses is an integer. As Formulation uses and Industrial end uses are reported in the same table they are numbered starting at 1001 for Formulation and starting at 2001 for Industrial end uses. In the CSR both numbering systems are reported.</p>						

9.0.2. Scope and type of exposure assessment

9.0.2.1. Environment

Table 42. Scope and type of exposure assessment based on hazard assessment

Protection target	Type of assessment	Explanation / Justification
Water: Fresh Water (Pelagic)	Exposure assessment and risk characterisation not required	Aquatic toxicity unlikely. See justification in section 7.1.2.
Water: Fresh Water (Sediment)	Qualitative risk characterisation with quantitative exposure assessment where applicable	No exposure of sediment expected
Water: Marine Water (Pelagic)	Exposure assessment and risk characterisation not required	Aquatic toxicity unlikely. See justification in section 7.1.2.
Water: Marine Water (Sediment)	Qualitative risk characterisation with quantitative exposure assessment where applicable	No exposure of sediment expected
Water: Fresh Water Food Chain (Predators)	Exposure assessment and risk characterisation not required	No potential for bioaccumulation No potential to cause toxic effects if accumulated via the food chain Justification: No classification is proposed, based on the low toxicity observed with the degradation products of Uronium hydrogen sulphate. A low potential of bioaccumulation is predicted, thus no potential of secondary poisoning.
Water: Marine Water Food Chain (Predators)	Exposure assessment and risk characterisation not required Exposure assessment and risk characterisation not required	No potential for bioaccumulation No potential to cause toxic effects if accumulated via the food chain Justification: No classification is proposed, based on the low toxicity observed with the degradation products of Uronium hydrogen sulphate. A low potential of bioaccumulation is predicted, thus no potential of secondary poisoning.
Water: Marine Water Food Chain (Top Predators)	Exposure assessment and risk characterisation not required Exposure assessment and risk characterisation not required	No potential for bioaccumulation No potential to cause toxic effects if accumulated via the food chain Justification: No classification is proposed, based on the low toxicity observed with the degradation products of Uronium hydrogen sulphate. A low potential of bioaccumulation is predicted, thus no potential of secondary poisoning.
Water: Sewage Treatment Plant (Effluent)	Quantitative	Quantitative exposure assessment (EUSES 2.1) and risk characterisation
Air	Quantitative exposure assessment	
Soil: Agricultural Soil	Qualitative risk characterisation with quantitative exposure assessment where applicable	Low toxicity is predicted for Uronium hydrogen sulphate: the substance is used as a plant nutrient (N-source) in fertiliser, hence toxicity is unlikely.

Protection target	Type of assessment	Explanation / Justification
		The degradation products (urea, sulfates ions) are ubiquitous and widely used as fertilisers. No effect is expected on soil macro- and micro-organisms, and in plants.
Soil: Terrestrial Food Chain (Predators)	Exposure assessment and risk characterisation not required	No PNEC oral because no potential for bioaccumulation
	Exposure assessment and risk characterisation not required	No potential to cause toxic effects if accumulated via the food chain Justification: No classification is proposed, based on the low toxicity observed with the degradation products of Uronium hydrogen sulphate. A low potential of bioaccumulation is predicted, thus no potential of secondary poisoning.

9.0.2.2. Worker

Table 43. Scope and type of exposure assessment based on hazard assessment

Route of exposure and type of effects	Type of assessment	Explanation / Justification
Inhalation: Acute, Local	Exposure assessment and risk characterisation not required	The substance does not meet the criteria to be classified dangerous for respiratory irritation/corrosion and respiratory sensitisation.
Inhalation: Acute, Systemic	Exposure assessment and risk characterisation not required	The substance does not meet the criteria to be classified dangerous for acute toxicity.
Inhalation: Long term, Local	Exposure assessment and risk characterisation not required	The substance does not meet the criteria to be classified dangerous for respiratory irritation/corrosion and respiratory sensitisation.
Inhalation: Long term, Systemic	Quantitative	Quantitative exposure assessment and risk characterisation. See DNEL in section 5.11.2.
Dermal: Acute, Local	Qualitative risk characterisation with quantitative exposure assessment where applicable	No-threshold effect and/or no dose-response information available
Dermal: Acute, Systemic	Exposure assessment and risk characterisation not required	The substance does not meet the criteria to be classified dangerous for acute toxicity.
Dermal: Long term, Local	Qualitative risk characterisation with quantitative exposure assessment where applicable	No-threshold effect and/or no dose-response information available
Dermal: Long term, Systemic	Quantitative	Quantitative exposure assessment and risk characterisation. See DNEL in section 5.11.2.

Hazard level (for qualitative assessment)

The hazard level is assigned based on the classification of the substance. The assignment rules are described in section E.3.4.4 of part E of the Guidance on Information Requirement and Chemical Safety Assessment. The hazard level determines the risk management strategy to be described in the exposure scenarios.

Hazard level: Moderate

Justification: Substances with the R-phrases R41 (risk of serious damage to the eyes), which relate to severe irritant effects to the eye, are allocated to the moderate hazard category on the basis that exposure to such eye damaging substances should be well-controlled (See guidance part E.3.4.2)

9.0.3. Regional environmental exposure from the releases of all exposure scenarios covered

9.0.3.1. Total releases

- **Water:** 513.1 tonnes/year
- **Air:** 156.9 tonnes/year
- **Soil:** 221.9 tonnes/year

9.0.3.2. Regional exposure: environment

Table 44. Summary of predicted regional exposure concentrations (Regional PEC)

Protection target	Regional PEC
Fresh Water (Sediment)	0.002 mg/kg dw
Marine Water (Sediment)	2.27E-4 mg/kg dw
Air	8.88E-7 mg/m ³
Agricultural Soil	5.27E-4 mg/kg dw

9.0.3.3. Regional exposure: man via environment

Regional total estimated daily intake for humans: 9.634E-5 mg/kg bw/day

Table 45. Summary of estimated daily human doses through intake and concentrations in food from regional exposure

Type of food	Estimated daily dose from regional exposure	Concentration in food from regional exposure
Drinking water	5.66E-5 mg/kg bw/day	0.002 mg/L
Fish	1.73E-6 mg/kg bw/day	0.001 mg/kg
Leaf crops	2.79E-5 mg/kg bw/day	0.002 mg/kg
Root crops	1.01E-5 mg/kg bw/day	0.002 mg/kg
Meat	7.49E-10 mg/kg bw/day	1.74E-7 mg/kg
Milk	1.4E-8 mg/kg bw/day	1.74E-6 mg/kg

9.1. Manufacturing of fertilizers, including maintenance or cleaning

9.1.1. Exposure scenario

Manufacturing of fertilizers, including maintenance or cleaning	
Environment:	ERC 1
Worker	
Process during manufacturing (PROC 1)	PROC 1
Process during manufacturing (PROC 4)	PROC 4

Operational conditions and risk management measures

Control of environmental exposure: Manufacturing of fertilizers, including maintenance or cleaning

Product characteristics

Amounts used

Daily use at a site <= 10 tonnes/day

Annual use at a site <= 1E3 tonnes/year

Percentage of tonnage used at regional scale = 100 %

Frequency and duration of use

Environment factors not influenced by risk management

Receiving surface water flow rate >= 1.8E4 m3/d

Other given operational conditions affecting environmental exposure

Technical conditions and measures at process level (source) to prevent release

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Organizational measures to prevent/limit release from site

Conditions and measures related to municipal sewage treatment plant

Municipal STP Yes [Water: 87.3%]

Discharge rate of STP >= 2E3 m3/d

Application of the STP sludge on agricultural soil Yes

Conditions and measures related to external treatment of waste for disposal

Conditions and measures related to external recovery of waste

Additional good practice advice beyond the REACH CSA

Control of workers exposure for "Process during manufacturing (PROC 1) " [PROC 1]

Inhal*) Derm*)
Loc Sys Loc Sys

Product characteristics

Substance in preparation No L

Amounts used

Frequency and duration of use/exposure

Duration of activity 1 - 4 hours L

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Place of use Indoors L

Surface of skin exposed One hand face only (240 cm2) L L

Technical conditions and measures at process level (source) to prevent release

Level of containment Use in closed process, no likelihood of exposure L

Technical conditions and measures to control dispersion from source towards the worker

Local Exhaust Ventilation	No	L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure				
Conditions and measures related to personal protection, hygiene and health evaluation				
Respiratory protection	Respiratory protection is not used	L		
gloves	chemically resistant gloves with 'basic' training [Dermal: 90%]		AL	L
Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training [PPE16]				
Safety glasses	Safety glasses		AL	L
Wear glasses to protect the eyes against projection.				
Protective clothing	Protective clothing		AL	L
Wear suitable protective clothing				
Additional good practice advice beyond the REACH CSA				

*) The route of exposure (**Inhalation**, **Dermal**) and type of effect (**Local**, **Systemic** and **Acute** or **Long term**) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Process during manufacturing (PROC 4) " [PROC 4]				
		Inhal*)	Derm*)	
		Loc Sys	Loc Sys	
Product characteristics				
Substance in preparation	Yes	L		
Concentration of substance in product	> 25%	L		
Amounts used				
Frequency and duration of use/exposure				
Duration of activity	15 mins – 1 hour	L		
Human factors not influenced by risk management				
Other given operational conditions affecting workers exposure				
Place of use	Indoors	L		
Surface of skin exposed	Two hands face (480 cm2)		L	L
Technical conditions and measures at process level (source) to prevent release				
Level of containment	Use in batch and other process (synthesis) where opportunity for exposure arises	L		
Technical conditions and measures to control dispersion from source towards the worker				
Local Exhaust Ventilation	Yes [Inhalation: 90%; Dermal: 90%]	L	L	L
Organisational measures to prevent /limit releases, dispersion and exposure				
Conditions and measures related to personal protection, hygiene and health evaluation				
Respiratory protection	Respiratory protection is not used	L		
gloves	chemically resistant gloves with 'basic' training [Dermal: 90%]		AL	L
Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training [PPE16]				
Safety glasses	Safety glasses		AL	L
Wear glasses to protect the eyes against projection.				
Protective clothing	Protective clothing		AL	L
Wear suitable protective clothing				

Additional good practice advice beyond the REACH CSA

*) The route of exposure (**Inhalation**, **Dermal**) and type of effect (**Local**, **Systemic** and **Acute** or **Long term**) for which the determinant has been used for exposure estimation are reported.

9.1.2. Exposure estimation for Manufacturing of fertilizers, including maintenance or cleaning

9.1.2.1. Exposure estimation for the environment (Manufacturing of fertilizers, including maintenance or cleaning)

Caution: The following parameter(s) are outside the boundaries of the EUSES model:

nullParameters are outside the boundaries: PartitionCoefficient MeltingFreezingPoint

9.1.2.1.1. Environmental releases

Table 46. Summary of the local releases to the environment

Compartment	Release factor estimation method	Explanation / Justification
Water	ERC (ERC 1)	Release factor after on site risk management (%): 6 Local release rate (kg/day): 831.6
Air	ERC (ERC 1)	Release factor after on site risk management (%): 5 Local release rate (kg/day): 693
Soil	ERC (ERC 1)	Release factor after on site risk management (%): 0.01

Summed releases from all life cycle stages: see section 9.0.3.

9.1.2.1.2. Environmental exposure

Table 47. Summary of exposure concentrations

Protection target	Exposure concentration	Explanation / Justification
Water: Fresh Water (Sediment)	Local PEC: 19.7 mg/kg dw	
Water: Marine Water (Sediment)	Local PEC: 1.97 mg/kg dw	
Water: Sewage Treatment Plant (Effluent)	Local PEC: 52.6 mg/L	
Air	Local PEC: 0.053 mg/m ³	
Soil: Agricultural Soil	Local PEC: 0.153 mg/kg dw Local concentration: 0.152 mg/kg dw	

For regional PECs see section 9.0.3.2.

9.1.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The exposure concentrations in air are reported in the Table "Summary of exposure concentrations" of the preceding section 9. x.2.1.2 "Environmental exposure".

Exposure via food consumption: Total daily intake for humans

Table 48. Summary of estimated daily human doses and concentrations in food

Type of food	Daily human dose through intake		Explanation / Justification
	Total estimated daily intake for humans: 1.656 mg/kg bw/day		
	Estimated daily dose through intake from local exposure	Concentration in food from local exposure	
Drinking water	0.041 mg/kg bw/day	1.44 mg/L	
Fish	0.003 mg/kg bw/day	2.04 mg/kg	
Leaf crops	1.61 mg/kg bw/day	94.1 mg/kg	
Root crops	0.002 mg/kg bw/day	0.274 mg/kg	
Meat	2.2E-5 mg/kg bw/day	0.005 mg/kg	
Milk	4.1E-4 mg/kg bw/day	0.051 mg/kg	
	Dose from regional exposure: see section 9.0.3.3		

9.1.2.2. Exposure estimation for Worker for Process during manufacturing (PROC 1)

Table 49. Summary of exposure concentrations for contributing scenario: Process during manufacturing (PROC 1)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.039 mg/m ³	Method: Extended TRA workers Name: TRA workers	
Dermal: Acute, Local		Method: Conditions of use (OC/RMM) Name: Acute local	
Dermal: Long term, Local	0.01 mg/cm ²	Method: Extended TRA workers Name: TRA workers	
Dermal: Long term, Systemic	0.034 mg/kg bw/day	Method: Extended TRA workers Name: TRA workers	

9.1.2.2. Exposure estimation for Worker for Process during manufacturing (PROC 4)

Table 50. Summary of exposure concentrations for contributing scenario: Process during manufacturing (PROC 4)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.655 mg/m ³	Method: Extended TRA workers Name: TRA workers	
Dermal: Acute, Local		Method: Conditions of use (OC/RMM) Name: Acute, local	
Dermal: Long term, Local	0.01 mg/cm ²	Method: Extended TRA workers Name: TRA workers	
Dermal: Long term, Systemic	0.069 mg/kg bw/day	Method: Extended TRA workers Name: TRA workers	

9.2. Formulation stage: Formulation of preparations and/or re-packing

9.2.1. Exposure scenario

Formulation stage: Formulation of preparations and/or re-packing	
Environment:	ERC 2
Worker	
Use related to formulation: Handling and packaging of fertilizers (PROC 8b)	PROC 8b
Use related to formulation: Handling and packaging of fertilizers (PROC 9)	PROC 9
Operational conditions and risk management measures	

Control of environmental exposure: Formulation stage: Formulation of preparations and/or re-packing	
Product characteristics	
Amounts used	
Daily use at a site	<= 1 tonnes/day
Annual use at a site	<= 10 tonnes/year
Percentage of tonnage used at regional scale	= 100 %
Frequency and duration of use	
Environment factors not influenced by risk management	
Receiving surface water flow rate	>= 1.8E4 m ³ /d
Other given operational conditions affecting environmental exposure	
Technical conditions and measures at process level (source) to prevent release	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Organizational measures to prevent/limit release from site	
Conditions and measures related to municipal sewage treatment plant	

EC number:
244-343-6

Uronium hydrogen sulphate

CAS number:
21351-39-3

Municipal STP	Yes [Water: 87.3%]
Discharge rate of STP	>= 2E3 m3/d
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Conditions and measures related to external recovery of waste	
Additional good practice advice beyond the REACH CSA	

Control of workers exposure for "Use related to formulation: Handling and packaging of fertilizers (PROC 8b) " [PROC 8b]			
		Inhal*)	Derm*)
		Loc Sys	Loc Sys
Product characteristics			
Substance in preparation	Yes	L	
Concentration of substance in product	> 25%	L	
Amounts used			
Frequency and duration of use/exposure			
Duration of activity	1 - 4 hours	L	
Human factors not influenced by risk management			
Other given operational conditions affecting workers exposure			
Place of use	Indoors	L	
Surface of skin exposed	Two hands face (480 cm2)		L L
Technical conditions and measures at process level (source) to prevent release			
Technical conditions and measures to control dispersion from source towards the worker			
Local Exhaust Ventilation	Yes [Inhalation: 97%; Dermal: 90%]	L	L L
Organisational measures to prevent /limit releases, dispersion and exposure			
Conditions and measures related to personal protection, hygiene and health evaluation			
Respiratory protection	Respiratory protection is not used	L	
gloves	chemically resistant gloves with 'basic' training [Dermal: 90%]		AL L
Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training [PPE16]			
Safety glasses	Safety glasses		AL L
Wear glasses to protect the eyes against projection.			
Protective clothing	Protective clothing		AL L
Wear suitable protective clothing			
Additional good practice advice beyond the REACH CSA			

*) The route of exposure (**Inhalation**, **Dermal**) and type of effect (**Local**, **Systemic** and **Acute** or **Long term**) for which the determinant has been used for exposure estimation are reported.

Control of workers exposure for "Use related to formulation: Handling and packaging of fertilizers

(PROC 9) " [PROC 9]			
		Inhal*)	Derm*)
		Loc Sys	Loc Sys
Product characteristics			
Substance in preparation	Yes	L	
Concentration of substance in product	> 25%	L	
Amounts used			
Frequency and duration of use/exposure			
Duration of activity	1 - 4 hours	L	
Human factors not influenced by risk management			
Other given operational conditions affecting workers exposure			
Place of use	Indoors	L	
Surface of skin exposed	Two hands face (480 cm2)		L L
Technical conditions and measures at process level (source) to prevent release			
Technical conditions and measures to control dispersion from source towards the worker			
Local Exhaust Ventilation	Yes [Inhalation: 90%; Dermal: 90%]	L	L L
Organisational measures to prevent /limit releases, dispersion and exposure			
Conditions and measures related to personal protection, hygiene and health evaluation			
Respiratory protection	Respiratory protection is not used	L	
gloves	chemically resistant gloves with 'basic' training [Dermal: 90%]		AL L
Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training [PPE16]			
Safety glasses	Safety glasses		AL L
Wear glasses to protect the eyes against projection.			
Protective clothing	Protective clothing		AL L
Wear suitable protective clothing			
Additional good practice advice beyond the REACH CSA			

*) The route of exposure (**Inhalation**, **Dermal**) and type of effect (**Local**, **Systemic** and **Acute** or **Long term**) for which the determinant has been used for exposure estimation are reported.

9.2.2. Exposure estimation for Formulation stage: Formulation of preparations and/or re-packing

9.2.2.1. Exposure estimation for the environment (Formulation stage: Formulation of preparations and/or re-packing)

Caution: The following parameter(s) are outside the boundaries of the EUSES model:

nullParameters are outside the boundaries: PartitionCoefficient MeltingFreezingPoint

9.2.2.1.1. Environmental releases

Table 51. Summary of the local releases to the environment

Compartment	Release factor estimation method	Explanation / Justification
Water	ERC	Release factor after on site risk management (%): 2

Compartment	Release factor estimation method	Explanation / Justification
	(ERC 2)	Local release rate (kg/day): 26.4
Air	ERC (ERC 2)	Release factor after on site risk management (%): 2.5 Local release rate (kg/day): 33
Soil	ERC (ERC 2)	Release factor after on site risk management (%): 0.01

Summed releases from all life cycle stages: see section 9.0.3.

9.2.2.1.2. Environmental exposure

Table 52. Summary of exposure concentrations

Protection target	Exposure concentration	Explanation / Justification
Water: Fresh Water (Sediment)	Local PEC: 0.627 mg/kg dw	
Water: Marine Water (Sediment)	Local PEC: 0.063 mg/kg dw	
Water: Sewage Treatment Plant (Effluent)	Local PEC: 1.67 mg/L	
Air	Local PEC: 2.52E-4 mg/m ³	
Soil: Agricultural Soil	Local PEC: 0.005 mg/kg dw Local concentration: 0.005 mg/kg dw	

For regional PECs see section 9.0.3.2.

9.2.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The exposure concentrations in air are reported in the Table "Summary of exposure concentrations" of the preceding section 9. x.2.1.2 "Environmental exposure".

Exposure via food consumption: Total daily intake for humans

Table 53. Summary of estimated daily human doses and concentrations in food

Type of food	Daily human dose through intake		Explanation / Justification
	Total estimated daily intake for humans: 1.656 mg/kg bw/day		
	Estimated daily dose through intake from local exposure	Concentration in food from local exposure	
Drinking water	0.041 mg/kg bw/day	1.44 mg/L	
Fish	0.003 mg/kg bw/day	2.04 mg/kg	
Leaf crops	1.61 mg/kg bw/day	94.1 mg/kg	

Type of food	Daily human dose through intake		Explanation / Justification
Root crops	0.002 mg/kg bw/day	0.274 mg/kg	
Meat	2.2E-5 mg/kg bw/day	0.005 mg/kg	
Milk	4.1E-4 mg/kg bw/day	0.051 mg/kg	
	Dose from regional exposure: see section 9.0.3.3		

9.2.2.2. Exposure estimation for Worker for Use related to formulation: Handling and packaging of fertilizers (PROC 8b)

Table 54. Summary of exposure concentrations for contributing scenario: Use related to formulation: Handling and packaging of fertilizers (PROC 8b)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.589 mg/m ³	Method: Extended TRA workers Name: TRA workers	
Dermal: Acute, Local		Method: Conditions of use (OC/RMM) Name: Acute, local	
Dermal: Long term, Local	0.01 mg/cm ²	Method: Extended TRA workers Name: TRA workers	
Dermal: Long term, Systemic	0.069 mg/kg bw/day	Method: Extended TRA workers Name: TRA workers	

9.2.2.2. Exposure estimation for Worker for Use related to formulation: Handling and packaging of fertilizers (PROC 9)

Table 55. Summary of exposure concentrations for contributing scenario: Use related to formulation: Handling and packaging of fertilizers (PROC 9)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	1.964 mg/m ³	Method: Extended TRA workers Name: TRA workers	
Dermal: Acute, Local		Method: Conditions of use (OC/RMM) Name: Acute, local	
Dermal: Long term, Local	0.01 mg/cm ²	Method: Extended TRA workers Name: TRA workers	

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Dermal: Long term, Systemic	0.069 mg/kg bw/day	Method: Extended TRA workers Name: TRA workers	

9.3. Professional end-use stage: Wide dispersive use (outdoor)

9.3.1. Exposure scenario

Professional end-use stage: Wide dispersive use (outdoor)	
Sector of use: SU 1 - Agriculture, forestry, fishery	
Environment:	ERC 8e
Worker Professional use: wide dispersive use outdoor (PROC 8a)	PROC 8a
Operational conditions and risk management measures	

Control of environmental exposure: Professional end-use stage: Wide dispersive use (outdoor)	
Product characteristics	
Amounts used	
Daily wide dispersive use	< 1 tonnes/day
Frequency and duration of use	
Environment factors not influenced by risk management	
Receiving surface water flow rate	>= 1.8E4 m3/d
Other given operational conditions affecting environmental exposure	
Technical conditions and measures at process level (source) to prevent release	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Organizational measures to prevent/limit release from site	
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes [Water: 87.3%]
Discharge rate of STP	>= 2E3 m3/d
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Conditions and measures related to external recovery of waste	
Additional good practice advice beyond the REACH CSA	

Control of workers exposure for "Professional use: wide dispersive use outdoor (PROC 8a) " [PROC 8a]			
		Inhal*) Loc Sys	Derm*) Loc Sys
Product characteristics			
Substance in preparation	Yes	L	
Concentration of substance in product	> 25%	L	
Amounts used			
Frequency and duration of use/exposure			
Duration of activity	15 mins - 1 hour	L	
Human factors not influenced by risk management			
Other given operational conditions affecting workers exposure			
Place of use	Outdoors	L	
Surface of skin exposed	Two hands (960 cm ²)		L L
Technical conditions and measures at process level (source) to prevent release			
Technical conditions and measures to control dispersion from source towards the worker			
Local Exhaust Ventilation	No	L	L L
Organisational measures to prevent /limit releases, dispersion and exposure			
Conditions and measures related to personal protection, hygiene and health evaluation			
Respiratory protection	Respiratory protection capable offering a 95% reduction in inhaled concentrations of the substance	L	
gloves	chemically resistant gloves with 'basic' training [Dermal: 90%]		AL L
Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training [PPE16]			
Safety glasses	Safety glasses		AL L
Wear glasses to protect the eyes against projection.			
Protective clothing	Protective clothing		AL L
Wear suitable protective clothing			
Additional good practice advice beyond the REACH CSA			

*) The route of exposure (**Inhalation**, **Dermal**) and type of effect (**Local**, **Systemic** and **Acute** or **Long term**) for which the determinant has been used for exposure estimation are reported.

9.3.2. Exposure estimation for Professional end-use stage: Wide dispersive use (outdoor)

9.3.2.1. Exposure estimation for the environment (Professional end-use stage: Wide dispersive use (outdoor))

Caution: The following parameter(s) are outside the boundaries of the EUSES model:

nullParameters are outside the boundaries: PartitionCoefficient MeltingFreezingPoint

9.3.2.1.1. Environmental releases

Table 56. Summary of the local releases to the environment

Compartment	Release factor estimation method	Explanation / Justification
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Compartment	Release factor estimation method	Explanation / Justification
Water	ERC (ERC 8e)	Release factor after on site risk management (%): 2 Local release rate (kg/day): 0.015
Air	ERC (ERC 8e)	Release factor after on site risk management (%): 0.1 Local release rate (kg/day): 0
Soil	ERC (ERC 8e)	Release factor after on site risk management (%): 1

Summed releases from all life cycle stages: see section 9.0.3.

9.3.2.1.2. Environmental exposure

Table 57. Summary of exposure concentrations

Protection target	Exposure concentration	Explanation / Justification
Water: Fresh Water (Sediment)	Local PEC: 0.003 mg/kg dw	
Water: Marine Water (Sediment)	Local PEC: 2.99E-4 mg/kg dw	
Water: Sewage Treatment Plant (Effluent)	Local PEC: 9.65E-4 mg/L	
Air	Local PEC: 8.88E-7 mg/m ³	
Soil: Agricultural Soil	Local PEC: 5.3E-4 mg/kg dw Local concentration: 2.61E-6 mg/kg dw	

For regional PECs see section 9.0.3.2.

9.3.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The exposure concentrations in air are reported in the Table "Summary of exposure concentrations" of the preceding section 9. x.2.1.2 "Environmental exposure".

Exposure via food consumption: Total daily intake for humans

Table 58. Summary of estimated daily human doses and concentrations in food

Type of food	Daily human dose through intake		Explanation / Justification
	Total estimated daily intake for humans: 1.656 mg/kg bw/day		
	Estimated daily dose through intake from local exposure	Concentration in food from local exposure	
Drinking water	0.041 mg/kg bw/day	1.44 mg/L	
Fish	0.003 mg/kg bw/day	2.04 mg/kg	

Type of food	Daily human dose through intake		Explanation / Justification
Leaf crops	1.61 mg/kg bw/day	94.1 mg/kg	
Root crops	0.002 mg/kg bw/day	0.274 mg/kg	
Meat	2.2E-5 mg/kg bw/day	0.005 mg/kg	
Milk	4.1E-4 mg/kg bw/day	0.051 mg/kg	
	Dose from regional exposure: see section 9.0.3.3		

9.3.2.2. Exposure estimation for Worker for Professional use: wide dispersive use outdoor (PROC 8a)

Table 59. Summary of exposure concentrations for contributing scenario: Professional use: wide dispersive use outdoor (PROC 8a)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	1.146 mg/m ³	Method: Extended TRA workers Name: TRA workers	
Dermal: Acute, Local		Method: Conditions of use (OC/RMM) Name: Acute, local	
Dermal: Long term, Local	0.1 mg/cm ²	Method: Extended TRA workers Name: TRA workers	
Dermal: Long term, Systemic	1.371 mg/kg bw/day	Method: Extended TRA workers Name: TRA workers	

9.4. Professional end-use stage: Wide dispersive use (indoor)

9.4.1. Exposure scenario

Professional end-use stage: Wide dispersive use (indoor)	
Sector of use: SU 1 - Agriculture, forestry, fishery	
Environment:	ERC 8b
Worker Professional use: non dispersive use (PROC 8b)	PROC 8b
Operational conditions and risk management measures	

Control of environmental exposure: Professional end-use stage: Wide dispersive use (indoor)

Product characteristics	
Amounts used	
Daily wide dispersive use	< 1 tonnes/day
Frequency and duration of use	
Environment factors not influenced by risk management	
Receiving surface water flow rate	>= 1.8E4 m3/d
Other given operational conditions affecting environmental exposure	
Technical conditions and measures at process level (source) to prevent release	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Organizational measures to prevent/limit release from site	
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes [Water: 87.3%]
Discharge rate of STP	>= 2E3 m3/d
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Conditions and measures related to external recovery of waste	
Additional good practice advice beyond the REACH CSA	

Control of workers exposure for "Professional use: non dispersive use (PROC 8b) " [PROC 8b]			
		Inhal*)	Derm*)
		Loc Sys	Loc Sys
Product characteristics			
Substance in preparation	Yes	L	
Concentration of substance in product	> 25%	L	
Amounts used			
Frequency and duration of use/exposure			
Duration of activity	15 mins – 1 hour	L	
Human factors not influenced by risk management			
Other given operational conditions affecting workers exposure			
Place of use	Indoors	L	
Surface of skin exposed	Two hands face (480 cm2)		L L
Technical conditions and measures at process level (source) to prevent release			
Technical conditions and measures to control dispersion from source towards the worker			
Local Exhaust Ventilation	Yes [Inhalation: 90%; Dermal: 90%]	L	L L
Organisational measures to prevent /limit releases, dispersion and exposure			
Conditions and measures related to personal protection, hygiene and health evaluation			
Respiratory protection	Respiratory protection capable offering a 95% reduction in inhaled concentrations of the substance	L	

gloves	chemically resistant gloves with 'basic' training [Dermal: 90%]	AL	L
Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training [PPE16]			
Safety glasses	Safety glasses	AL	L
Wear glasses to protect the eyes against projection.			
Protective clothing	Protective clothing	AL	L
Wear suitable protective clothing			
Additional good practice advice beyond the REACH CSA			

*) The route of exposure (**Inhalation**, **Dermal**) and type of effect (**Local**, **Systemic** and **Acute** or **Long term**) for which the determinant has been used for exposure estimation are reported.

9.4.2. Exposure estimation for Professional end-use stage: Wide dispersive use (indoor)

9.4.2.1. Exposure estimation for the environment (Professional end-use stage: Wide dispersive use (indoor))

Caution: The following parameter(s) are outside the boundaries of the EUSES model:

Parameters are outside the boundaries: PartitionCoefficient MeltingFreezingPoint

9.4.2.1.1. Environmental releases

Table 60. Summary of the local releases to the environment

Compartment	Release factor estimation method	Explanation / Justification
Water	ERC (ERC 8b)	Release factor after on site risk management (%): 2 Local release rate (kg/day): 0.015
Air	ERC (ERC 8b)	Release factor after on site risk management (%): 0.1 Local release rate (kg/day): 0
Soil	ERC (ERC 8b)	Release factor after on site risk management (%): 0

Summed releases from all life cycle stages: see section 9.0.3.

9.4.2.1.2. Environmental exposure

Table 61. Summary of exposure concentrations

Protection target	Exposure concentration	Explanation / Justification
Water: Fresh Water (Sediment)	Local PEC: 0.003 mg/kg dw	
Water: Marine Water (Sediment)	Local PEC: 2.99E-4 mg/kg dw	
Water: Sewage Treatment Plant (Effluent)	Local PEC: 9.65E-4 mg/L	
Air	Local PEC: 8.88E-7 mg/m ³	
Soil: Agricultural Soil	Local PEC: 5.3E-4 mg/kg dw Local concentration: 2.61E-6	

Protection target	Exposure concentration	Explanation / Justification
	mg/kg dw	

For regional PECs see section 9.0.3.2.

9.4.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The exposure concentrations in air are reported in the Table "Summary of exposure concentrations" of the preceding section 9. x.2.1.2 "Environmental exposure".

Exposure via food consumption: Total daily intake for humans

Table 62. Summary of estimated daily human doses and concentrations in food

Type of food	Daily human dose through intake		Explanation / Justification
	Total estimated daily intake for humans: 1.656 mg/kg bw/day		
	Estimated daily dose through intake from local exposure	Concentration in food from local exposure	
Drinking water	0.041 mg/kg bw/day	1.44 mg/L	
Fish	0.003 mg/kg bw/day	2.04 mg/kg	
Leaf crops	1.61 mg/kg bw/day	94.1 mg/kg	
Root crops	0.002 mg/kg bw/day	0.274 mg/kg	
Meat	2.2E-5 mg/kg bw/day	0.005 mg/kg	
Milk	4.1E-4 mg/kg bw/day	0.051 mg/kg	
	Dose from regional exposure: see section 9.0.3.3		

9.4.2.2. Exposure estimation for Worker for Professional use: non dispersive use (PROC 8b)

Table 63. Summary of exposure concentrations for contributing scenario: Professional use: non dispersive use (PROC 8b)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.065 mg/m ³	Method: Extended TRA workers Name: TRA workers	
Dermal: Acute, Local		Method: Conditions of use (OC/RMM) Name: Acute, local	
Dermal: Long term, Local	0.01 mg/cm ²	Method: Extended TRA workers Name: TRA workers	

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Dermal: Long term, Systemic	0.069 mg/kg bw/day	Method: Extended TRA workers Name: TRA workers	

9.5. Professional end-use stage: non dispersive use (outdoor)

9.5.1. Exposure scenario

Professional end-use stage: non dispersive use (outdoor)	
Sector of use: SU 1 - Agriculture, forestry, fishery	
Environment:	ERC 9b
Worker	
Professional use: non dispersive use (PROC 2)	PROC 2
Operational conditions and risk management measures	

Control of environmental exposure: Professional end-use stage: non dispersive use (outdoor)	
Product characteristics	
Amounts used	
Daily wide dispersive use	<1 tonnes/day
Frequency and duration of use	
Environment factors not influenced by risk management	
Receiving surface water flow rate	>= 1.8E4 m3/d
Other given operational conditions affecting environmental exposure	
Technical conditions and measures at process level (source) to prevent release	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Organizational measures to prevent/limit release from site	
Conditions and measures related to municipal sewage treatment plant	
Municipal STP	Yes [Water: 87.3%]
Discharge rate of STP	>= 2E3 m3/d
Application of the STP sludge on agricultural soil	Yes
Conditions and measures related to external treatment of waste for disposal	
Conditions and measures related to external recovery of waste	
Additional good practice advice beyond the REACH CSA	

Control of workers exposure for "Professional use: non dispersive use (PROC 2) " [PROC 2]			
		Inhal*)	Derm*)
		Loc Sys	Loc Sys
Product characteristics			
Substance in preparation	Yes	L	
Concentration of substance in product	> 25%	L	
Amounts used			
Frequency and duration of use/exposure			
Duration of activity	15 mins – 1 hour	L	
Human factors not influenced by risk management			
Other given operational conditions affecting workers exposure			
Place of use	Outdoors	L	
Surface of skin exposed	Two hands face (480 cm2)		L L
Technical conditions and measures at process level (source) to prevent release			
Level of containment	Use in closed process, no likelihood of exposure	L	
Technical conditions and measures to control dispersion from source towards the worker			
Local Exhaust Ventilation	No	L	L L
Organisational measures to prevent /limit releases, dispersion and exposure			
Conditions and measures related to personal protection, hygiene and health evaluation			
Protective clothing	No protective clothing		A
Respiratory protection	Respiratory protection capable offering a 95% reduction in inhaled concentrations of the substance	L	
gloves	chemically resistant gloves with 'basic' training [Dermal: 90%]		AL L
Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training [PPE16]			
Safety glasses	Safety glasses		AL L
Wear glasses to protect the eyes against projection.			
Protective clothing	Protective clothing		L L
Wear suitable protective clothing			
Additional good practice advice beyond the REACH CSA			

*) The route of exposure (**Inhalation**, **Dermal**) and type of effect (**Local**, **Systemic** and **Acute** or **Long term**) for which the determinant has been used for exposure estimation are reported.

9.5.2. Exposure estimation for Professional end-use stage: non dispersive use (outdoor)

9.5.2.1. Exposure estimation for the environment (Professional end-use stage: non dispersive use (outdoor))

Caution: The following parameter(s) are outside the boundaries of the EUSES model:

nullParameters are outside the boundaries: PartitionCoefficient MeltingFreezingPoint

9.5.2.1.1. Environmental releases

Table 64. Summary of the local releases to the environment

Compartment	Release factor estimation method	Explanation / Justification
Water	ERC (ERC 9b)	Release factor after on site risk management (%): 5 Local release rate (kg/day): 0.038
Air	ERC (ERC 9b)	Release factor after on site risk management (%): 5 Local release rate (kg/day): 0
Soil	ERC (ERC 9b)	Release factor after on site risk management (%): 5

Summed releases from all life cycle stages: see section 9.0.3.

9.5.2.1.2. Environmental exposure

Table 65. Summary of exposure concentrations

Protection target	Exposure concentration	Explanation / Justification
Water: Fresh Water (Sediment)	Local PEC: 0.004 mg/kg dw	
Water: Marine Water (Sediment)	Local PEC: 3.53E-4 mg/kg dw	
Water: Sewage Treatment Plant (Effluent)	Local PEC: 0.002 mg/L	
Air	Local PEC: 8.88E-7 mg/m ³	
Soil: Agricultural Soil	Local PEC: 5.34E-4 mg/kg dw Local concentration: 6.53E-6 mg/kg dw	

For regional PECs see section 9.0.3.2.

9.5.2.1.3. Indirect exposure of humans via the environment

Exposure via inhalation

The exposure concentrations in air are reported in the Table "Summary of exposure concentrations" of the preceding section 9. x.2.1.2 "Environmental exposure".

Exposure via food consumption: Total daily intake for humans

Table 66. Summary of estimated daily human doses and concentrations in food

Type of food	Daily human dose through intake		Explanation / Justification
	Total estimated daily intake for humans: 1.656 mg/kg bw/day		
	Estimated daily dose through intake from local exposure	Concentration in food from local exposure	
Drinking water	0.041 mg/kg bw/day	1.44 mg/L	
Fish	0.003 mg/kg bw/day	2.04 mg/kg	

Type of food	Daily human dose through intake		Explanation / Justification
Leaf crops	1.61 mg/kg bw/day	94.1 mg/kg	
Root crops	0.002 mg/kg bw/day	0.274 mg/kg	
Meat	2.2E-5 mg/kg bw/day	0.005 mg/kg	
Milk	4.1E-4 mg/kg bw/day	0.051 mg/kg	
	Dose from regional exposure: see section 9.0.3.3		

9.5.2.2. Exposure estimation for Worker for Professional use: non dispersive use (PROC 2)

Table 67. Summary of exposure concentrations for contributing scenario: Professional use: non dispersive use (PROC 2)

Route of exposure and type of effects	Exposure concentration	Method / name of exposure assessment	Explanation / Justification
Inhalation: Long term, Systemic	0.229 mg/m ³	Method: Extended TRA workers Name: TRA workers	
Dermal: Acute, Local		Method: Conditions of use (OC/RMM) Name: Acute, local	
Dermal: Long term, Local	0.02 mg/cm ²	Method: Extended TRA workers Name: TRA workers	
Dermal: Long term, Systemic	0.137 mg/kg bw/day	Method: Extended TRA workers Name: TRA workers	