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December 2016

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

L-Lysine, *N*^{2},*N*^{6}-bis[*N*-(1-oxododecyl)glutamyl]-, sodium salt (1:?) (INCI name: Sodium dilauramidoglutamide lysine)

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act) and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Department of Health, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Department of the Environment and Energy.

This Public Report is available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:

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Director
NICNAS

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SUMMARY

The following details will be published in the NICNAS *Chemical Gazette:*

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS CHEMICAL	INTRODUCTION VOLUME	USE
STD/1595	Cintox Australia Pty Ltd	L-Lysine, N^2,N^6-bis[*N*-(1-oxododecyl)glutamyl]-, sodium salt (1:?) (INCI name: Sodium dilauramidoglutamide lysine)	ND*	< 2 tonnes per annum	Cosmetic ingredient

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
Based on the available information, the notified chemical is not recommended for classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

The environmental hazard classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS) is presented below. Environmental classification under the GHS is not mandated in Australia and carries no legal status but is presented for information purposes.

Hazard classification	*Hazard statement*
Acute Category 2	H401 – Toxic to aquatic life

Human health risk assessment
Under the conditions of the occupational settings described, the notified chemical is not considered to pose an unreasonable risk to the health of workers.

Based on the available information, when used at ≤ 1% concentration in cosmetic products, the notified chemical is not considered to pose an unreasonable risk to public health.

Environmental risk assessment
On the basis of the PEC/PNEC ratio and the reported use pattern, the notified chemical is not considered to pose an unreasonable risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to the notified chemical during reformulation:
  - Enclosed, automated processes, where possible

- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical during reformulation:
  - Avoid contact with skin and eyes

- A person conducting a business or undertaking at a workplace should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical during reformulation:
  - Coveralls
  - Impervious gloves
  - Eye protection

  Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- A copy of the (M)SDS should be easily accessible to employees.

- If products and mixtures containing the notified chemical are classified as hazardous to health in accordance with the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

Public Health

- Product formulators should exercise due care when using the notified chemical in cosmetic products given its potential ability to enhance the dermal penetration of other chemicals in the formulation.

Disposal

- Where reuse or recycling are not appropriate, dispose of the notified chemical in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

Emergency procedures

- Spills or accidental release of the notified chemical should be handled by physical containment, collection and subsequent safe disposal.

Regulatory Obligations

Secondary Notification
This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the chemical under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified chemical is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

(1) Under Section 64(1) of the Act; if
  - the concentration of the notified chemical exceeds or is intended to exceed 1% in cosmetic products;

or

(2) Under Section 64(2) of the Act; if
  - the function or use of the chemical has changed from a cosmetic ingredient, or is likely to change significantly;
  - the amount of chemical being introduced has increased, or is likely to increase, significantly;
  - the chemical has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the chemical on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

(Material) Safety Data Sheet
The (M)SDS of a product containing the notified chemical provided by the notifier was reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Cintox Australia Pty Ltd (ABN: 63 122 874 613)
Suite 1, Level 2
38-40 George Street
PARRAMATTA NSW 2150

NOTIFICATION CATEGORY
Standard: Chemical other than polymer (more than 1 tonne per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
No details are claimed exempt from publication.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed for acute dermal toxicity.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
EU (2011), Japan (2006), USA (2013)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Pellicer L-30 (contains ~30% notified chemical)
Pellicer LB-10 (contains ~10% notified chemical)
Pellicer LB-30G (contains ~30% notified chemical)

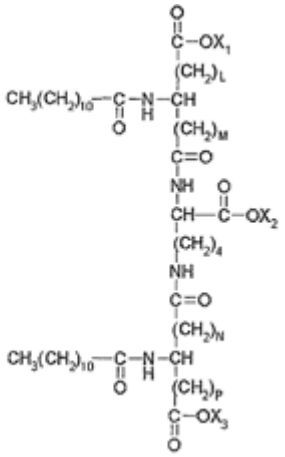
CAS NUMBER
1243654-79-6

CHEMICAL NAME
L-Lysine, N^2,N^6-bis[*N*-(1-oxododecyl)glutamyl]-, sodium salt (1:?)

OTHER NAME(S)
Sodium dilauramidoglutamide lysine (INCI name)

MOLECULAR FORMULA
$C_{40}H_{72}N_4O_{10}.xNa$

STRUCTURAL FORMULA



L,M=Integral number of 0 or 2
when L=2, M=0
when L=0, M=2
N,P=Integral number of 0 or 2
when N=2,P=0
when N=0, P=2
X1,X2,X3=Na orH
Not all is H and not all is Na

MOLECULAR WEIGHT
791 Da (X_1, X_2, X_3 = 1Na and 2H)
812.98 Da (X_1, X_2, X_3 = 2Na and 1H)

ANALYTICAL DATA
Reference NMR, IR, LC-MS and UV-Vis spectra were provided.

3. COMPOSITION

DEGREE OF PURITY
≥ 90%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS
None

NON HAZARDOUS IMPURITIES/RESIDUAL MONOMERS (> 1% BY WEIGHT)

Chemical Name	*N*-(1-oxododecyl)-glutamic acid (neutralised partially by sodium hydroxide)		
CAS No.	Unassigned	*Weight %*	≤ 8

Chemical Name	Dodecanoic acid (neutralised partially by sodium hydroxide)		
CAS No.	Unassigned	*Weight %*	≤ 2

ADDITIVES/ADJUVANTS

Chemical Name	1,3-Butanediol (for products LB-10 and LB-30G)		
CAS No.	107-88-0	*Weight %*	10% (LB-10); 6% (LB-30G)

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: white powder

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Decomposes without melting at 244 °C	Measured
Boiling Point	Decomposes without boiling at 244 °C	Measured
Density	1,205 kg/m^3 at 20 °C	Measured
Vapour Pressure	2.8×10^{-1} kPa at 20 °C	Measured
Water Solubility	> 200 g/L at 20 °C	Measured
Hydrolysis as a Function of pH	$t_{½}$ > 1 year at pH 4, 7 and 9	Measured
Partition Coefficient (n-octanol/water)	Log P_{OW} > 6.5	Measured; expected to partition to phase boundaries based on surface activity

Property	Value	Data Source/Justification
Surface Tension	35.2 mN/m at 20 °C	Measured
Adsorption/Desorption	Log K_{OC} < 1.25	Measured; expected to adsorb to soil and sediment based on surface activity
Dissociation Constant	pKa = 5.2 at 20 °C (acid) pKa = 8.0 at 20 °C (base)	Measured
Particle Size	Inhalable fraction (< 100 μm): 16% Respirable fraction (< 10 μm): 0.03%	Measured
Flammability	Not highly flammable	Measured
Pyrophoric properties	No pyrophoric properties	Measured
Autoignition Temperature	389 °C	Measured
Explosive Properties	No explosive properties	Measured
Oxidising Properties	No oxidising properties	Measured

DISCUSSION OF PROPERTIES
For full details of tests on physical and chemical properties, refer to Appendix A.

Reactivity
The notified chemical is expected to be stable under normal conditions of use.

Physical hazard classification
Based on the submitted physico-chemical data depicted in the above table, the notified chemical is not recommended for hazard classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified chemical will not be manufactured within Australia. The notified chemical will be imported into Australia as an aqueous solution at ≤ 30% concentration for reformulation into cosmetic products, or as a component of finished cosmetic products at ≤ 1% concentration.

MAXIMUM INTRODUCTION VOLUME OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	< 1	< 1	< 1.5	< 1.5	< 2

PORT OF ENTRY
Melbourne, Sydney and Perth

TRANSPORTATION AND PACKAGING
The notified chemical will be imported as an aqueous solution at ≤ 30% concentration in 1 or 18 kg cans for reformulation into cosmetic products, or as a component of finished cosmetic products in containers suitable for retail sale (typically 50-150 mL). Finished cosmetic products containing ≤ 1% notified chemical will be transported primarily by road to retail stores.

USE
The notified chemical will be used as an ingredient in cosmetic products at ≤ 1% concentration.

OPERATION DESCRIPTION
The notified chemical will be imported into Australia as an aqueous solution at ≤ 30% concentration for reformulation into cosmetic products, or as a component of finished cosmetic products at ≤ 1% concentration.

Reformulation
The procedures for reformulating the notified chemical as introduced at ≤ 30% concentration in aqueous solution will likely vary depending on the nature of the cosmetic products, and may involve both automated and manual transfer steps. In general, it is expected that the reformulation processes will involve blending operations that will normally be automated and occur in an enclosed system, followed by automated filling of the finished products into consumer containers of various sizes.

End-use
The finished products containing the notified chemical at ≤ 1% concentration may be used by consumers and professionals such as hairdressers and workers in beauty salons. Depending on the nature of the products, these could be applied in a number of ways, such as by hand or using an applicator. Spray application is not expected.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

Category of Worker	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Transport and storage workers	2	50
Reformulation workers	4	50
Quality control	1	50
Retail workers	2	250
Professional end users	3	250

EXPOSURE DETAILS

Transport and storage
Transport and storage workers may come into contact with the notified chemical either at ≤ 30% concentration as introduced in aqueous solution, or at ≤ 1% concentration in consumer products, only in the event of an unlikely accidental rupture of containers.

Reformulation
During reformulation into cosmetic products, dermal, ocular and inhalation exposure of workers to the notified chemical at ≤ 30% concentration may occur. Exposure is expected to be minimised through the use of exhaust ventilation and/or automated/enclosed systems as well as through the use of personal protective equipment (PPE) such as coveralls, eye protection, impervious gloves and respiratory protection (as appropriate).

End use
Exposure to the notified chemical in end-use products at ≤ 1% concentration may occur in professions where the services provided involve the application of cosmetic products to clients (e.g. hair dressers, workers in beauty salons). The principal route of exposure will be dermal, while ocular exposure is also possible. Such professionals may use some PPE to minimise repeated exposure and good hygiene practices are expected to be in place. If PPE is used, exposure of such workers is expected to be of a similar or lesser extent than that experienced by consumers using products containing the notified chemical.

6.1.2. Public Exposure
There will be widespread and repeated exposure of the public to the notified chemical at ≤ 1% concentration through the use of cosmetic products. The principal route of exposure will be dermal, while ocular exposure is also possible.

Data on typical use patterns of product categories in which the notified chemical may be used are shown in the following tables (SCCS, 2012; Cadby *et al.*, 2002). For the purposes of the exposure assessment, Australian use patterns for the various product categories are assumed to be similar to those in Europe. A dermal absorption (DA) of 100% was assumed for the notified chemical for calculation purposes. A lifetime average female body weight (BW) of 64 kg (enHealth, 2012) was used for calculation purposes.

Cosmetic products (dermal exposure)

Product type	**Amount** (mg/day)	**C** (%)	**Retention Factor (RF)** (unitless)	**Daily systemic exposure** (mg/kg bw/day)
Face cream	1540	1	1	0.2406
Hand cream	2160	1	1	0.3375
Shampoo	10460	1	0.01	0.0163
Conditioner	3920	1	0.01	0.0061

Product type	Amount (mg/day)	C (%)	Retention Factor (RF) (unitless)	Daily systemic exposure (mg/kg bw/day)
Shower gel	18670	1	0.01	0.0292
Hand wash soap	20000	1	0.01	0.0313
Total				0.661

C = concentration of the notified chemical; RF = retention factor.
Daily systemic exposure = (Amount × C × RF × DA)/BW

The worst case scenario estimation using these assumptions is for a person who is a simultaneous user of all products listed in the above tables that contain the notified chemical. This would result in a combined internal dose of 0.661 mg/kg bw/day.

6.2. Human Health Effects Assessment

The results from toxicological investigations conducted on the notified chemical and formulations containing the notified chemical are summarised in the following table. For full details of the studies, refer to Appendix B.

Endpoint	*Result and Assessment Conclusion*
Rat, acute oral toxicity	LD50 > 2000 mg/kg bw; low toxicity
Rabbit, skin irritation (30%)	non-irritating
Guinea pig, skin irritation (≤ 10%)	non-irritating
Human, skin irritation (5% and 10%)	non-irritating
Rabbit, eye irritation (0.9% and 0.95%)	non-irritating
Guinea pig, skin sensitisation – adjuvant test	no evidence of sensitisation
Rat, repeat dose oral toxicity – 28 days	NOAEL = 1000 mg/kg bw/day*
Mutagenicity – bacterial reverse mutation	non mutagenic
Genotoxicity – *in vitro* chromosome aberration test	non genotoxic

*For the product Pellicer L-30 containing the notified chemical at ~30% concentration

Toxicokinetics

Based on the relatively high molecular weight (> 500 Da) and partition coefficient (log Pow > 6.5) of the notified chemical, there is limited potential for the chemical to cross biological membranes. However, given the surfactant properties of the notified chemical it may enhance the dermal absorption of other chemicals.

Acute toxicity

The notified chemical was found to be of low toxicity via the oral route in a study conducted in rats.

Irritation

In a study conducted in rabbits, a solution containing 30% notified chemical was found to be non-irritating to the skin. In a study conducted in guinea pigs, solutions containing up to 10% notified chemical were also found to be non-irritating to the skin. In a human skin irritation test, water solutions containing 5% and 10% notified chemical was found to be non-irritating.

In a study conducted in rabbits, water solutions containing 0.9% and 0.95% notified chemical were found to be non-irritating to eyes.

Based on the available studies, the notified chemical is not irritating to the skin at ≤ 10% concentration and not irritating to eyes at ≤ 1% concentration. However given the surfactant properties of the notified chemical, irritation effects at higher concentrations cannot be ruled out.

Sensitisation

The notified chemical showed no evidence of sensitisation in a guinea pig maximisation test.

Repeated dose toxicity

A repeated dose oral (gavage) toxicity study on the product Pellicer L-30 (containing ~30% notified chemical) was conducted in rats, in which the test substance was administered at 100, 300 and 1000 mg/kg bw/day for 28 consecutive days, with a 14-day recovery period for high dose and control animals.

The No Observed Adverse Effect Level (NOAEL) was established as 1000 mg/kg bw/day (the highest dose tested) in the study, based on no treatment-related adverse changes noted at all doses tested.

Mutagenicity/Genotoxicity
The notified chemical was negative in a bacterial reverse mutation assay and in an *in vitro* chromosomal aberration study in Chinese hamster lung fibroblast cells.

Health hazard classification
Based on the available information, the notified chemical is not recommended for classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety
Based on the available toxicological information, eye irritation following exposure to the notified chemical at > 1% concentration and skin irritation following exposure to the notified chemical at > 10% concentration cannot be ruled out.

Reformulation
During reformulation workers may be at risk of eye and skin irritation effects when handling the notified chemical at ≤ 30% concentration. It is anticipated by the notifier that engineering controls such as enclosed and automated processes and local ventilation will be implemented where possible and appropriate PPE (coveralls, imperious gloves, eye protection and respiratory protection) will be used to limit workers exposure.

Therefore, under the occupational settings described, the risk to the health of workers from use of the notified chemical is not considered to be unreasonable.

End-use
Workers involved in professions where the services provided involve the application of cosmetic products containing the notified chemical to clients (*e.g.*, hairdressers and beauty salon workers) may be exposed to the notified chemical at concentrations up to 1%. Such professionals may use PPE to minimise repeated exposure, and good hygiene practices are expected to be in place. If PPE is used, the risk to such workers is expected to be of a similar or lesser extent than that experienced by consumers using the various products containing the notified chemical.

6.3.2. Public Health
Cosmetic products containing the notified chemical at ≤ 1% concentration will be available to the public. The main route of exposure is expected to be dermal with some potential for accidental ocular or oral exposure.

Irritation
Eye irritation following exposure to the notified chemical at > 1% concentration and skin irritation following exposure to the notified chemical at > 10% concentration cannot be ruled out. However, eye and skin irritation effects are not expected from use of the notified chemical at the proposed concentrations (≤ 1%) in cosmetic products.

Systemic effects
Based on the low concentration in end use products and low systemic toxicity of the product Pellicer L-30 (contains ≤ 30% notified chemical) (NOAEL = 1,000 mg/kg bw/day), systemic effects from repeated exposure are not expected.

As the notified chemical may have the potential to enhance dermal absorption of other chemicals due to its surfactant activity, care should be taken in formulating end-use products containing it.

Therefore, based on the information available, the risk to the public associated with use of the notified chemical at ≤ 1% concentration in cosmetic products is not considered to be unreasonable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified chemical will be imported into Australia as a component of raw material for reformulation into finished cosmetic products, or as a component of finished cosmetic products. There is unlikely to be any significant release to the environment from transport and storage, except in the case of accidental spills and leaks. In the event of spills, the products containing the notified chemical are expected to be collected with adsorbents, and disposed of to landfill in accordance with local government regulations.

The reformulation process will involve blending operations that will be highly automated, and is expected to occur within a fully enclosed environment. Therefore, significant release of the notified chemical from this process to the environment is not expected. The process will be followed by automated filling of the formulated products into end-use containers of various sizes suitable for retail. Wastes containing the notified chemical generated during reformulation include equipment wash water, residues in import containers, and spilt materials. It is estimated by the notifier that up to 1% of the import volume of the notified chemical (or up to 20 kg) may remain as residues in empty import containers. These are expected to be collected and recycled during subsequent blending processes. Empty import containers will be collected for recycling or disposal by licensed waste management services.

RELEASE OF CHEMICAL FROM USE

The notified chemical is expected to be released to the aquatic compartment through sewers during its use in various cosmetic products.

RELEASE OF CHEMICAL FROM DISPOSAL

It is estimated by the notifier that a maximum of 1% of the import volume of the notified chemical (or up to 20 kg), may remain in end-use containers once the cosmetic products are used up. Wastes and residue of the notified chemical in empty containers are likely to either share the fate of the container and be disposed of to landfill, or be released to the sewer system when containers are rinsed before recycling through an approved waste management facility.

7.1.2. Environmental Fate

Following its use in cosmetic products in Australia, the majority of the notified chemical is expected to enter the sewer system, before potential release to surface waters nationwide. Based on the results of a ready biodegradability study, the notified chemical is considered readily biodegradable (82-84% in 28 days). For details of the environmental fate study, please refer to Appendix C. Based on its surfactant properties, release to surface waters is unlikely to occur as partitioning to sludge and sediment is expected under environmental pH. The notified chemical is not expected to be bioaccumulative, due to its surfactant properties and ready biodegradability. Therefore, in surface waters the notified chemical is expected to disperse and degrade through biotic and abiotic processes to form water and oxides of carbon and nitrogen.

The majority of the notified chemical will be released to sewer after use. A small proportion of the notified chemical may be applied to land when effluent is used for irrigation, or when sewage sludge is used for soil remediation. The notified chemical may also be applied to land when disposed of to landfill as collected spills and empty container residue. Residues of the notified chemical in landfill, soil and sludge are expected to eventually degrade through biotic and abiotic processes to form water and oxides of carbon and nitrogen.

7.1.3. Predicted Environmental Concentration (PEC)

Based on the reported use in cosmetics products, it is assumed that 100% of the total import volume of the notified chemical will be released to the sewer. The release is assumed to be nationwide over 365 days per year. It is conservatively assumed that none of the notified chemical will be removed during sewage treatment plant (STP) processes.

Predicted Environmental Concentration (PEC) for the Aquatic Compartment		
Total Annual Import/Manufactured Volume	2,000	kg/year
Proportion expected to be released to sewer	100%	
Annual quantity of chemical released to sewer	2,000	kg/year

Predicted Environmental Concentration (PEC) for the Aquatic Compartment		
Days per year where release occurs	365	days/year
Daily chemical release:	5.48	kg/day
Water use	200.0	L/person/day
Population of Australia (Millions)	22.613	million
Removal within STP	0%	
Daily effluent production:	4,523	ML
Dilution Factor - River	1.0	
Dilution Factor - Ocean	10.0	
PEC - River:	1.212	µg/L
PEC - Ocean:	0.121	µg/L

STP effluent re-use for irrigation occurs throughout Australia. The agricultural irrigation application rate is assumed to be 1,000 L/m^2/year (10 ML/ha/year). The notified chemical in this volume is assumed to infiltrate and accumulate in the top 10 cm of soil (density 1,500 kg/m^3). Using these assumptions, irrigation with a concentration of 1.21 µg/L may potentially result in a soil concentration of approximately 8.08 µg/kg. Assuming accumulation of the notified chemical in soil for 5 and 10 years under repeated irrigation, the concentration of the notified chemical in the applied soil in 5 and 10 years may be approximately 40.39 µg/kg and 80.77 µg/kg, respectively.

7.2. Environmental Effects Assessment

The results from ecotoxicological investigations conducted on the notified chemical are summarised in the table below. Details of these studies can be found in Appendix C.

Endpoint	*Result*	*Assessment Conclusion*
Fish Toxicity	96 h EC50 = 9.39 mg/L	Toxic to fish
Daphnia Toxicity	48 h EC50 = 47.4 mg/L (WAF*)	Harmful to aquatic invertebrates
Algal Toxicity	72 h E_rC50 = 109.3 mg/L (WAF*)	Not harmful to algae
Inhibition of Bacterial Respiration	3 h EC50 = 162.2 mg/L	Moderately inhibitory to microbial respiration

* Water accommodated fraction

Based on the above ecotoxicological endpoints for the notified chemical, it is expected to be toxic to fish and harmful to aquatic invertebrates, but is not expected to be harmful to algae. Therefore, under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) (United Nations, 2009), the notified chemical is formally classified as "Acute Category 2; Toxic to aquatic life". Based on the acute toxicity, ready biodegradability and low bioaccumulation potential of the notified chemical, it is not formally classified under the GHS for chronic toxicity.

7.2.1. Predicted No-Effect Concentration

The predicted no-effects concentration (PNEC) has been calculated from the most sensitive endpoint for fish. A safety factor of 100 was used given acute endpoints for three trophic levels are available.

Predicted No-Effect Concentration (PNEC) for the Aquatic Compartment		
EC50 (Fish, 96 h)	9.39	mg/L
Assessment Factor	100	
Mitigation Factor	1.00	
PNEC:	93.9	µg/L

7.3. Environmental Risk Assessment

The Risk Quotient (Q = PEC/PNEC) has been calculated based on the predicted PEC and PNEC.

Risk Assessment	PEC µg/L	PNEC µg/L	Q
Q – River	1.212	93.9	**0.013**
Q – Ocean	0.121	93.9	**0.001**

The risk quotient for discharge of treated effluents containing the notified chemical to the aquatic environment indicates that the notified chemical is unlikely to reach ecotoxicologically significant concentrations in surface waters, based on its maximum annual importation quantity. The notified chemical is considered readily biodegradable, and is expected to have a low potential for bioaccumulation. On the basis of the PEC/PNEC ratio, maximum annual importation volume and assessed use pattern in cosmetic products, the notified chemical is not expected to pose an unreasonable risk to the environment.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Melting Point/Freezing Point Decomposes without melting at 244 °C

Method OECD TG 102 Melting Point/Melting Range.
Remarks The notified chemical started to decompose (darkened) at a temperature of 244 °C.
Test Facility LAB (2011)

Boiling Point Decomposes without boiling at 244 °C

Method OECD TG 103 Boiling Point.
Remarks Capillary method.
Test Facility CiToxLAB (2015a)

Density 1,250 kg/m^3 at 20 °C

Method OECD TG 109 Density of Liquids and Solids.
Remarks Pycnometer method
Test Facility CiToxLAB (2015b)

Vapour Pressure 2.8×10^{-1} kPa at 20 °C (extrapolated)
3.8×10^{-1} kPa at 25 °C (extrapolated)

Method EC Directive92/69/EEC A.4 Vapour Pressure.
Remarks Isoteniscope principle
Test Facility CiToxLAB (2015c)

Water Solubility > 200 g/L at 20 °C

Method OECD TG 105 Water Solubility.
Remarks Flask Method
Test Facility CiToxLAB (2015d)

Hydrolysis as a Function of pH $t_{½}$ > 1 year at pH 4, 7 and 9

Method OECD TG 111 Hydrolysis as a Function of pH.
EC Council Regulation No 440/2008 C.7 Degradation: Abiotic Degradation: Hydrolysis as a Function of pH.

pH	*T (°C)*	*$t_{½}$*
4	25	> 1 year
7	25	> 1 year
9	25	> 1 year

Remarks After 5 days under the accelerated conditions of 50 °C the rate of hydrolysis of the test substance was less than 10% at pH 4, 7 and 9. This equates to a half-life at 25 °C of $t_{½}$ > 1 year. Therefore, it can be concluded that under the conditions of the test, the test substance is expected to be hydrolytically stable.
Test Facility CiToxLAB (2015e)

Partition Coefficient (n-octanol/water) log Pow > 6.5

Method OECD TG 117 Partition Coefficient (n-octanol/water).
Remarks HPLC Method
Test Facility CiToxLAB (2015f)

Surface Tension 35.2 mN/m at 20 °C

Method OECD TG 115 Surface Tension of Aqueous Solutions.

Remarks Concentration: 1 mg/mL
Test Facility CiToxLAB (2015g)

Adsorption/Desorption log K_{oc} < 1.25

Method OECD TG 121 Estimation of the Adsorption Coefficient (K_{OC}) on Soil and on Sewage Sludge using High Performance Liquid Chromatography (HPLC)
EC Council Regulation No. 440/2008 Method C.19 Estimation of the Adsorption Coefficient (K_{OC}) on Soil and on Sewage Sludge using High Performance Liquid Chromatography (HPLC).
Remarks HPLC Method
Test Facility CiToxLAB (2015h)

Dissociation Constant pKa = 5.2 at 20 °C (acid)
pKa = 8.0 at 20 °C (base)

Method OECD TG 112 Dissociation Constants in Water.
Remarks Titration Method
Test Facility CiToxLAB (2015i)

Particle Size

Method OECD TG 110 Particle Size Distribution/Fibre Length and Diameter Distributions.

Range (μm)	*Mass (%)*
< 100	16
< 10	0.0219
< 5.5	0.0082

Remarks Too few particles were of a size of < 10 μm to allow accurate assessment of mass median aerodynamic diameter.
Test Facility Harlan (2009)

Flammability Not highly flammable

Method EC Directive92/69/EEC A.10 Flammability (Solids).
Test Facility CiToxLAB (2015j)

Pyrophoric Properties No pyrophoric properties

Method EC Directive92/69/EEC A.13 Pyrophoric Properties of Solids and Liquids.
Test Facility CiToxLAB (2015k)

Autoignition Temperature 389 °C

Method EC Directive92/69/EEC A.16 Relative Self-Ignition Temperature for Solids.
Test Facility CiToxLAB (2015l)

Explosive Properties No explosive properties

Method EC Council Regulation No 440/2008 A.14 Explosive Properties.
Remarks Determined by BAM fall hammer test, BAM friction test and Koenen steel tube test
Test Facility Harlan (2009)

Oxidizing Properties No oxidizing properties

Method EC Directive92/69/EEC A.17 Oxidizing Properties (Solids).
Remarks Determined by maximum burning rate in different mixtures
Test Facility CiToxLAB (2015m)

APPENDIX B: TOXICOLOGICAL INVESTIGATIONS

B.1. Acute toxicity – oral

TEST SUBSTANCE	Notified chemical (29.8% solution)
METHOD	Similar to OECD TG 401 Acute Oral Toxicity – Limit Test.
Species/Strain	Rat/Wistar
Vehicle	Not stated
Remarks - Method	No significant protocol deviations. The dose was adjusted for the concentration of the notified chemical in the test substance.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw*	*Mortality*
1	5 per sex	2000	0/10

LD50	> 2000 mg/kg bw
Signs of Toxicity	There were no unscheduled deaths.
Effects in Organs	No abnormalities were noted at necropsy.
Remarks - Results	All animals showed expected body weight gain.
CONCLUSION	The notified chemical is of low toxicity via the oral route.
TEST FACILITY	DSTC (2015)

B.2. Irritation – skin

TEST SUBSTANCE	Notified chemical (30% solution)
METHOD	Similar to OECD TG 404 Acute Dermal Irritation/Corrosion.
Species/Strain	Rabbit/New Zealand White
Number of Animals	3
Vehicle	Not stated
Observation Period	48 hours
Type of Dressing	Occlusive
Remarks - Method	No significant protocol deviations
RESULTS	No irritation reactions were noted.
Remarks - Results	No clinical signs of systemic toxicity were noted.
CONCLUSION	The test substance is non-irritating to the skin.
TEST FACILITY	DSTC (2005a)

B.3. Irritation – skin

TEST SUBSTANCE	Notified chemical (0.5%, 1%, 3%, 5%, 10% solutions)
METHOD	In-house
Species/Strain	Guinea pig/Hartley
Number of Animals	5 F
Vehicle	Not stated
Observation Period	24 hours after each application was made
Type of Dressing	None
Remarks - Method	Open application was used to provide the dosing solution by drawing a circle 8 times by a Telflon rod. The procedure was repeated once a day, 14 times in total.

RESULTS No irritation reactions were noted.

Remarks - Results No clinical signs of systemic toxicity were noted.

CONCLUSION The test substances are non-irritating to the skin.

TEST FACILITY DSTC (2004)

B.4. Skin irritation – human volunteers

TEST SUBSTANCE Notified chemical (5% and 10%)

METHOD Repeated insult patch test with challenge
Study Design Patches containing 0.1 mL test substance were applied for 24 hours. Sites were assessed 30 minutes and 24 hours after removal of the patches.
Study Group 23 F, 22 M; age range 20-68 years; including 3 patients with skin disease
Vehicle Distilled water
Remarks - Method Occluded. Patch size was not reported.

RESULTS
Remarks - Results No positive reactions were noted in any subject.

CONCLUSION The test substances are non-irritating to the skin.

TEST FACILITY DSTC (2005b)

B.5. Irritation – eye

TEST SUBSTANCE Notified chemical (0.9% and 0.95% aqueous solutions)

METHOD Similar to OECD TG 405 Acute Eye Irritation/Corrosion.
Species/Strain Rabbit/New Zealand White
Number of Animals 3 for each test substance
Observation Period 96 hours
Remarks - Method No significant protocol deviations

RESULTS

Test substance: 0.9% notified chemical

Lesion	*Mean Score* Animal No.*			*Maximum Value*	*Maximum Duration of Any Effect*	*Maximum Value at End of Observation Period*
	1	2	3			
Conjunctiva: redness	0	0	0	1	< 6 h	0
Conjunctiva: chemosis	0	0	0	0	-	0
Conjunctiva: discharge	0	0	0	0	-	0
Corneal opacity	0	0	0	0	-	0
Iridial inflammation	0	0	0	0	-	0

* Calculated on the basis of the scores at 24, 48, and 72 hours for EACH animal.

Test substance: 0.95% notified chemical

Lesion	*Mean Score* Animal No.*			*Maximum Value*	*Maximum Duration of Any Effect*	*Maximum Value at End of Observation Period*
	1	2	3			
Conjunctiva: redness	0	0	0	1	< 6 h	0
Conjunctiva: chemosis	0	0	0	0	-	0
Conjunctiva: discharge	0	0	0	0	-	0
Corneal opacity	0	0	0	0	-	0

Iridial inflammation	0	0	0	0	-	0

* Calculated on the basis of the scores at 24, 48, and 72 hours for EACH animal.

Remarks - Results: No abnormalities were noted in the general condition of the animals and all animals showed normal body weight gain.

CONCLUSION: The test substances are non-irritating to the eye.

TEST FACILITY: DSTC (2016a)

B.6. Skin sensitisation

TEST SUBSTANCE: Notified chemical

METHOD: Similar to OECD TG 406 Skin Sensitisation – Magnusson and Kligman.

Species/Strain: Guinea pig/Hartley

PRELIMINARY STUDY: Maximum Non-irritating Concentration:
intradermal: 0.03%
topical: 1%

MAIN STUDY

Number of Animals: Test Group: 10 F Control Group: 5 F

Vehicle: Physiological saline solution (intradermal)/Water (topical)

Positive control: Conducted in parallel with the test substance using 2,4-dinitrochlorobenzene.

INDUCTION PHASE: Induction Concentration:
intradermal: 0.3%
topical: 3%

Signs of Irritation: No information in the report

CHALLENGE PHASE

challenge: topical: 0.003%, 0.01%, 0.03%, 0.1%, 0.3%, 1% solutions

Remarks - Method: In the main study, the site of application was changed by individual animal of each group aiming at averaging the reactions at different sites.

RESULTS

Animal	*Challenge Concentration*	*Number of Animals Showing Skin Reactions after: 1st challenge*	
		24 h	*48 h*
Test Group	0.003%, 0.01%, 0.03%, 0.1%, 0.3%, 1%	0/10	0/10
Vehicle Control Group	0.003%, 0.01%, 0.03%, 0.1%, 0.3%, 1%	0/5	0/5

Remarks - Results: No clinical signs were noted in the general condition of all animals that showed normal body weight gain. None of the test animals showed any skin reaction during the challenge phase.

No animals in the vehicle control group exhibited skin reactions. In the positive control group, positive response was observed dose-dependently.

CONCLUSION: There was no evidence of reactions indicative of skin sensitisation to the notified chemical under the conditions of the test.

TEST FACILITY: DSTC (2016b)

B.7. Repeat dose toxicity

TEST SUBSTANCE: Notified chemical (27.45% solution)

METHOD: OECD TG 407 Repeated Dose 28-day Oral Toxicity Study in Rodents.

Species/Strain	Rat/Crl:CD(SD)
Route of Administration	Oral – gavage
Exposure Information	Total exposure days: 28 days Dose regimen: 7 days per week Post-exposure observation period: 14 days
Vehicle	Water for injection
Remarks - Method	No significant protocol deviations. The dose was not adjusted for the concentration of the notified chemical in the test substance.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw/day*	*Mortality*
control	5 per sex	0	0/10
low dose	5 per sex	100	0/10
mid dose	5 per sex	300	0/10
high dose	5 per sex	1000	0/10
control recovery	5 per sex	0	0/10
high dose recovery	5 per sex	1000	0/10

Mortality and Time to Death

No unscheduled deaths occurred.

Clinical Observations

There were no adverse clinical signs throughout the treatment and recovery periods. Body weight and food consumption in all the treatment groups were comparable to the control.

Frequency of urination in the treated male animals was statistically lower during Week 4. The difference was not considered by the study authors to be of biological significance due to the differences were biologically slight.

Grip strength of the hindlimbs in the male animals of the high dose group was statistically lower. The difference was not considered by the study authors to be treatment-related due to the male animals of the high dose recovery group exhibited higher grip strength during Week 4.

There were no other substantial changes in sensory reactivity, grip strengths and locomoter activities.

Laboratory Findings – Clinical Chemistry, Haematology, Urinalysis

There were no biologically significant differences to the controls noted in the haematology, clinical biochemistry or urinalysis data.

Statistically higher relative count of large unstained cells (LUCs) in female animals of the high dose group was not considered by the study authors to be of biological significance as there was no difference in the absolute count of the LUCs.

Statistically significant changes in platelet count in female animals of the low dose group and in mean corpuscular haemoglobin concentration (MCHC) in female animals of the mid dose group were not considered by the study authors to be of biological significance as there was no dose-dependencies.

Statistically significant changes in alanine aminotransferase (ALT) in male animals of the high dose group were not considered by the study authors to be of biological significance as other relevant parameters and pathological findings revealed no abnormalities.

Statistically significant decrease in urinary volume and increase in osmotic pressure noted on Day 23 in male animals of the high dose recovery group was not considered by the study authors to be of biological significance as the high dose group showed no such significant differences on Day 23.

Increase of total protein in female animals of the low dose group, supported by the increase of the serum albumin, was considered by the study authors to be of little biological significance as no relevant abnormalities were found in other examinations and the changes were almost within physiological variations. Furthermore,

the high dose recovery group showed no abnormal changes in total protein and albumin.

Effects in Organs
No treatment-related differences were noted in organ weight changes. No treatment-related abnormalities were noted in the necropsy or histopathology.

CONCLUSION
The No Observed Adverse Effect Level (NOAEL) was established as 1000 mg/kg bw/day in this study, based on no treatment-related adverse changes noted at all doses tested.

TEST FACILITY BSRC (2010)

B.8. Genotoxicity – bacteria

TEST SUBSTANCE Notified chemical

METHOD Similar to OECD TG 471 Bacterial Reverse Mutation Test.
Pre incubation procedure

Species/Strain	*S. typhimurium*: TA1535, TA1537, TA98, TA100 *E. coli*: WP2uvrA
Metabolic Activation System	S9 mix from phenobarbital/β-naphthoflavone induced rat liver
Concentration Range in Main Test	a) With metabolic activation: 313-5000 µg/plate b) Without metabolic activation: 313-5000 µg/plate
Vehicle	Distilled water
Remarks - Method	The dose selection for the main test was based on the toxicity results in the preliminary test. Positive controls: With metabolic activation: 2-aminoanthracene (TA1535, WP2uvrA); benzo(a)pyrene (TA98, TA100, TA1537) Without metabolic activation: 2-(2-furyl)-3-(5-nitro-2-furyl)acrylamide [TA98, TA100, WP2uvrA]; 9-aminoacridine (TA1537); sodium azide (TA1535)

RESULTS

Metabolic Activation	*Test Substance Concentration (µg/plate) Resulting in:*			
	Cytotoxicity in Preliminary Test	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Test 1	> 5000	> 5000	> 5000	negative
Present				
Test 1	> 5000	> 5000	> 5000	negative

Remarks - Results No significant increases in the frequency of revertant colonies were noted for any of the bacterial strains, with any dose of the test substance, either with or without metabolic activation.

The positive and negative controls gave a satisfactory response confirming the validity of the test system.

CONCLUSION The notified chemical was not mutagenic to bacteria under the conditions of the test.

TEST FACILITY JBS (2003)

B.9. Genotoxicity – in vitro

TEST SUBSTANCE Notified chemical (28.8% solution)

METHOD: Similar to OECD TG 473 In vitro Mammalian Chromosome Aberration Test.

Species/Strain: Chinese hamster

Cell Type/Cell Line: Lung fibroblast

Metabolic Activation System: S9 mix from β-naphthoflavone/phenobarbitone induced rat liver

Vehicle: Physiological saline

Remarks - Method: The dose was adjusted for the concentration of the notified chemical in the test substance. A cytostatic test was carried out at 10-5000 µg/mL. The dose selection for the main experiments was based on toxicity observed in the cytostatic test

Vehicle and positive controls (mitomycin C and N-nitrosodimethylamine) were run concurrently with the notified chemical.

Metabolic Activation	*Test Substance Concentration (µg/mL)*	*Exposure Period*	*Harvest Time*
Absent			
Test 1	625*, 1250*, 1875*, 2500*	6h	24h
Test 2	300*, 400*, 500*, 600	24h	24h
Test 3	160*, 260*, 360*, 460*	48h	48h
Present			
Test 1	625*, 1250*, 1875*, 2500*	6h	24h

*Cultures selected for metaphase analysis.

RESULTS

Metabolic Activation	*Test Substance Concentration (µg/mL) Resulting in:*			
	Cytotoxicity in Preliminary Test	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Test 1	> 1250	> 625	> 2500	negative
Test 2	> 313	> 400	> 600	negative
Test 3	> 313	> 360	> 460	negative
Present				
Test 1	> 1250	> 1250	> 2500	negative

Remarks - Results: In the main tests, no statistically significant increases in the frequency of cells with structural or numerical chromosome aberrations were noted in the presence or absence of metabolic activation.

The results of the positive controls confirmed the validity of the test system.

CONCLUSION: The notified chemical was not clastogenic to Chinese hamster lung fibroblast cells treated in vitro under the conditions of the test.

TEST FACILITY: BML (2005)

APPENDIX C: ENVIRONMENTAL FATE AND ECOTOXICOLOGICAL INVESTIGATIONS

C.1. Environmental Fate

C.1.1. Ready biodegradability

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 301 C Ready Biodegradability: Modified MITI Test (I).
Inoculum	Activated sewage and surface water sludge
Exposure Period	28 days
Auxiliary Solvent	None
Analytical Monitoring	Biochemical Oxygen Demand (BOD)
Remarks - Method	The test was conducted in accordance with the test guideline above, with no significant deviation in protocol reported.

RESULTS

Test substance		*Aniline*	
Day	*% Degradation*	*Day*	*% Degradation*
7	58-60	7	64
14	75-79	14	76
21	81-84	21	76
28	82-84	28	76

Remarks - Results	All validity criteria for the test were satisfied. The percentage degradation of the reference compound surpassed the threshold level of 60% by 7 days (64%). Therefore, the tests indicate the suitability of the inoculum. The degree of degradation of the test substance after 28 days was 82-84%. As the test substance is surface active, the 10-day window is not applicable. Therefore, the test substance is considered to be readily biodegradable according to the OECD (301 C) guideline.
CONCLUSION	The notified chemical is readily biodegradable.
TEST FACILITY	CERI (2003)

C.2. Ecotoxicological Investigations

C.2.1. Acute toxicity to fish

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 203 Fish, Acute Toxicity Test – Semi-static.
Species	*Brachydanio rerio* (zebra fish)
Exposure Period	96 hours
Auxiliary Solvent	None
Water Hardness	140 mg $CaCO_3$/L
Analytical Monitoring	Dissolved Organic Carbon (DOC)
Remarks – Method	The test was conducted in accordance with the test guideline above, with no significant deviation in protocol reported.

RESULTS

Concentration mg/L		*Number of Fish*	*Mortality (%)*			
Nominal	*Actual*		*24 h*	*48 h*	*72 h*	*96 h*
Control	Control	21	0	0	0	0
5	4.34	21	0	0	0	4.76
8	7.55	21	0	0	4.76	19.05

10	9.79	21	0	9.52	38.10	57.14
15	16.4	21	0	33.33	90.48	100
20	18.9	21	19.05	66.67	100	100

LC50	9.39 mg/L (95% CI 8.87-9.94 mg/L) at 96 hours
NOEC	Not determined
Remarks – Results	All validity criteria for the test were satisfied. The test solutions were renewed every 24 hours during the 96 h test period. The actual concentrations of the test substance were measured every 24 hours during the 96 h test period. The 96 h LC50 for fish was determined to be 9.39 mg/L (95% CI 8.87-9.94 mg/L), based on measured concentrations.

CONCLUSION The notified chemical is considered to be toxic to fish.

TEST FACILITY PEAPC (2010)

C.2.2. Acute toxicity to aquatic invertebrates

TEST SUBSTANCE Notified chemical

METHOD OECD TG 202 Daphnia sp. Acute Immobilisation Test and Reproduction Test – Semi-static.

Species	*Daphnia magna*
Exposure Period	48 hours
Auxiliary Solvent	None
Water Hardness	159 mg $CaCO_3$/L
Analytical Monitoring	HPLC
Remarks - Method	The test substance was prepared as a Water Accommodated Fraction (WAF) due to its low solubility in the test medium. A stock solution with a nominal loading rate of 1,000 mg/L was prepared by stirring the test substance in test medium for 2 days, and any undissolved material was removed by filtration. The test was conducted in accordance with the test guideline above, with no significant deviation in protocol reported.

RESULTS

Concentration mg/L		*Number of D. magna*	*Cumulative Immobilised (%)*	
Nominal	*Actual*		*24 h*	*48 h*
Control	Control	20	0	0
6.3	2.5	20	0	0
12.5	8.7	20	0	0
25.0	19.4	20	0	10
50.0	39.5	20	20	50
100.0	89.3	20	35	75

EC50	47.4 mg/L (WAF; 95% CI 42.0-53.4 mg/L) at 48 hours
NOEC (or LOEC)	8.7 mg/L (WAF) at 48 hours
Remarks - Results	All validity criteria for the test were satisfied. The test solutions were renewed every 24 hours during the 48 h test period. The actual concentrations of the test substance were measured every 24 hours during the 48 h test period. As measured concentrations deviated from the nominal concentrations by the end of the test, the geometric mean measured concentrations were used. The 48 h EC50 and NOEC for daphnids were determined to be 47.4 mg/L and 8.7 mg/L, respectively, based on the geometric mean measured concentrations.

CONCLUSION The notified chemical is considered to be harmful to aquatic invertebrates.

TEST FACILITY CiToxLAB (2015n)

C.2.3. Algal growth inhibition test

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 201 Freshwater Alga and Cyanobacteria, Growth Inhibition Test.
Species	*Pseudokirchneriella subcapitata* (green alga)
Exposure Period	72 hours
Concentration Range	Nominal: 6.3-100 mg/L Actual: 3.0-30.1 mg/L
Auxiliary Solvent	None
Water Hardness	Not reported
Analytical Monitoring	HPLC
Remarks - Method	The test substance was prepared as a Water Accommodated Fraction (WAF) due to its low solubility in the test medium. A stock solution with a nominal loading rate of 1,000 mg/L was prepared by stirring the test substance in test medium for 2 days, and any undissolved material was removed by filtration. The test was conducted in accordance with the test guideline above, with no significant deviation in protocol reported.

RESULTS

Biomass		*Growth*	
E_bC50 *mg/L at 72 h*	*NOE_bC* *mg/L*	*E_rC50* *mg/L at 72 h*	*NOE_rC* *mg/L*
33.9	14.9	109.3	7.5

Remarks - Results	All validity criteria for the test were satisfied. Renewal of the test solutions was not specified. The actual concentrations of the test substance were measured every 24 hours during the 72 h test period. As measured concentrations deviated from the nominal concentrations by the end of the test, the geometric mean measured concentrations were used. The 72 h EC50 and NOEC for algae were determined to be 109.3 mg/L and 7.5 mg/L, respectively, based on geometric mean measured concentrations.
CONCLUSION	The notified chemical is not considered to be harmful to algae.
TEST FACILITY	CiToxLAB (2015o)

C.2.4. Inhibition of microbial activity

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 209 Activated Sludge, Respiration Inhibition Test.
Inoculum	Activated sewage sludge
Exposure Period	3 hours
Concentration Range	Nominal: 10-1,000 mg/L Actual: Not determined
Remarks – Method	The test was conducted in accordance with the test guideline above, with no significant deviation in protocol reported. 3,5-Dichlorophenol was used as the reference control. The respiration rate was determined by measurement of Biochemical Oxygen Demand during the test after 3 hours of exposure.
RESULTS	
EC50	162.2 mg/L (95% Cl 130.1-202.2 mg/L) at 3 hours
NOEC	< 10 mg/L at 3 hours
Remarks – Results	All validity criteria for the test were satisfied. Increasing inhibition of microbial respiration was observed with increasing test substance concentration (83.3% inhibition at 1,000 mg/L of the test substance). The 3

	h EC50 and NOEC were determined to be 162.2 mg/L (95% Cl 130.1-202.2 mg/L) and <10 mg/L, respectively, based on nominal concentrations.
CONCLUSION	The notified chemical is moderately inhibitory to microbial respiration.
TEST FACILITY	CiToxLAB (2015p)

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