File No: STD/1264

30 April 2008

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Cetiol Sensoft

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (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 Ageing, 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, Water, Heritage and the Arts.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at 334-336 Illawarra Road, Marrickville NSW 2204.

This Full Public Report is also 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:

Street Address:	334 - 336 Illawarra Road MARRICKVILLE NSW 2204, AUSTRALIA.
Postal Address:	GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL:	+ 61 2 8577 8800
FAX	+ 61 2 8577 8888
Website:	www.nicnas.gov.au

Director
NICNAS

TABLE OF CONTENTS

FULL PUBLIC REPORT

Cetiol Sensoft

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Cognis Australia Pty Ltd (ABN 87 006 374 456)
4 Saligna Drive
Tullamarine, Melbourne, VIC 3043

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

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication: Chemical name, other names, molecular formula, molecular weight, structural formula, CAS number, recipient identity, spectral data, impurities and introduction volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
Switzerland, Germany and Japan. Notifications are currently underway in China, Canada and Korea.

2. IDENTITY OF CHEMICAL

OTHER NAME(S)
Proposed INCI name: Propylheptyl Caprylate

MOLECULAR WEIGHT
< 500 Da

ANALYTICAL DATA
Reference NMR, IR, HPLC, GC, UV spectra were provided.

3. COMPOSITION

DEGREE OF PURITY >80%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS
None

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20°C AND 101.3 kPa: Colourless, clear liquid

Property	Value	Data Source/Justification
Melting Point/Freezing Point	-38.9 °C	Measured
Boiling Point	319.0 °C at 101.3 kPa	Measured
Density	858.9 kg/m^3 at 20°C	Measured
Vapour Pressure	1.6×10^{-5} kPa at 25°C	Measured
Water Solubility	<0.01 mg/L at 20°C	Measured

Hydrolysis as a Function of pH	$t_{1/2}$ = 7564 h (pH 4), 3155 h (pH 7) and 5513 h (pH 9) at 25ºC	Measured
Partition Coefficient (n-octanol/water)	log Pow = 9 at 25ºC (beyond the maximum value of 6.19 of the calibration range)	Measured
Adsorption/Desorption	log K_{oc} = 4.8 at 25ºC	Measured
Dissociation Constant	Not determined	Not applicable due to the absence of functional groups that would be expected to dissociate.
Flash Point	160 ºC at 101 kPa	Measured
Flammability	Not determined	Unlikely to present a hazard due to the low vapour pressure.
Autoignition Temperature	235 ºC	Measured
Explosive Properties	Not explosive	Measured

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

Reactivity
Expected to be stable under normal conditions. No thermal decomposition observed up to 400 °C.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified chemical will not be manufactured in Australia. The notified chemical will be imported as the neat chemical in 175 kg drums.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	1-3	1-3	1-3	1-3	5-10

PORT OF ENTRY
Throughout Australia

IDENTITY OF RECIPIENTS
The notified chemical is expected to be supplied to major cosmetic marketers throughout Australia.

TRANSPORTATION AND PACKAGING
The notified chemical is imported in 175 kg drums. The drums are stretch-wrapped on pallets inside shipping containers. The containers are transported from the docks to the notifier's warehouse by road where they are unpacked. The drums containing the notified chemical are then transported to the reformulation sites by road. After reformulation the notified chemical will be repackaged for end use in packaging that the notifier expects will be no larger than 500 mL.

USE
The notified chemical will be used as a component of cosmetic products.
The notified chemical will be used in both skin and hair care products as an emollient, at concentrations between 3 and 10% but may be present at up to a 20% concentration in moisturisers with secondary sunscreens.

OPERATION DESCRIPTION
Details on how the notified chemical is to be used are not available to the notifier. The following is a typical operation description for similar chemicals in cosmetic products.

The notified chemical will not be manufactured within Australia.
After the notified chemical has been imported it will be sold to personal-care product manufacturers where it will be reformulated to produce a variety of cosmetic products.

Reformulation

While the reformulation process will vary with the product and reformulation site, it is expected that most sites will have closed, automated mixing and dosing equipment. The reformulation process may involve the transfer of the drums containing the notified chemical by forklift from the warehouse to the mixing area. The drum is then placed on scales and attached to the mixing vessel by hoses and the required amount pumped into the mixing vessel. The notified chemical is blended with other cosmetic ingredients, without heating. At the end of the reformulation process a sample will be taken for quality control purposes. A typical reformulation process may occur once or twice per month to produce up to one tonne of personal care product. The finished personal care product is then transferred from the mixing vessel to a range of container types and sizes, the largest of which is expected to be 500 mL, using an automated filling line. The packaged consumer products will be transported to retail outlets for sale to the public.

End use
There is potential for the finished products to be used occupationally, for example by beauticians or hairdressers using cosmetic products. Depending on the nature of the cosmetic product these could be applied a number of ways such as by hand, using an applicator or sprayed.

6. HUMAN HEALTH IMPLICATIONS

6.1 Exposure assessment

6.1.1 Occupational exposure

NUMBER AND CATEGORY OF WORKERS
Details of occupational exposure are not available to the notifier. The following occupational exposure table is given as an example of the likely exposure based on similar chemicals in cosmetic products.

Category of Worker	*Number*	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Transport and warehouse workers	1 – 2/site	Incidental Exposure only	Intermittent
Reformulation facility workers	1 – 3/site	0.25 - 2	20 - 50
Retail workers	> 100	Incidental Exposure only	Intermittent
Beauticians and hairdressers	8000	Up to 8	200

EXPOSURE DETAILS
Details on customer formulation operations, worker exposure and life cycle of the notified chemical are not available to the notifier. The number and category of workers will vary depending on the nature of the customers' business. However, it is anticipated that typical practices by cosmetic manufacturers will include the use of adequate local ventilation, appropriate PPE, enclosed mixing vessel and filling areas as well as a high degree of process automation to protect workers.

Transport and warehouse workers will be exposed to the notified chemical only in the event of a spill due to an accident or leaking drum. Workers may wear protective overalls, hard hats, chemical resistant gloves and safety glasses.

Reformulation
At customer reformulation facilities, exposure to the notified chemical or products containing the notified chemical (3 - 20%) is possible during handling of the drums, cleaning and maintenance of the equipment. Dermal, and eye contact (due to splashing) are likely to be the main routes of exposure. Inhalation exposure is likely to be negligible due to the low vapour pressure of the notified chemical and the automation of the formulation process. The level of exposure would vary from site to site depending on the level of automation of the formulation process. The worst case dermal exposure is expected to be to workers directly handling the notified chemical, and is estimated to be 0 - 0.1 mg/cm^2/day, based on EASE model (assumptions: non-dispersive use, direct-handling and incidental exposure). Therefore, assuming a surface area of 420 cm^2 (one hand) for a 70 kg worker and a 100% dermal absorption factor, systemic exposure is estimated to be 0-0.6 mg/kg bw/day. Exposure is likely to be minimised by good personal hygiene practices (eg. washing hands after any contact, before breaks and meals, etc) and use of industrial standard PPE.

End use

Exposure of beauticians and hairdressers to the notified chemical at concentrations of < 20% could occur during final application of the cosmetic products to their clients. The main route of exposure is expected to be dermal, although ocular exposure to splashes is possible. PPE is not expected to be worn, however good hygiene practices are expected to be in place.

6.1.2. Public exposure

The general public will be repeatedly exposed to the notified chemical via a number of different consumer products (typical levels 3 - 10%, up to a maximum of 20%).

Use of moisturisers with secondary sunscreens and body lotions is expected to give the highest single exposure because of the relatively high concentration of the notified chemical in the products applied, and the "leave-on" nature of these products. The maximum dermal exposure is estimated using consumer exposure data (SCCP, 2006). In all calculations the retention factor for these products is assumed to be 1. In a worse case scenario 8 g/day of moisturiser containing a secondary sunscreen is expected to be used with the notified chemical present at a concentration of 20%. Assuming a default consumer body weight of 60 kg (for females) and 100% dermal absorption (due to the low molecular weight) the exposure is estimated to be 27 mg/kg bw/day. However, the notifier has stated that the use of the notified chemical in secondary sunscreens will not be a typical application. Therefore, in the scenario where the notified chemical is used in body lotions at a 10% concentration with 8 g of product used per day the exposure is estimated to be 13 mg/kg bw/day.

Public exposure from transport, storage, reformulation or disposal is considered to be negligible.

Since products containing the notified chemical are stored and used in a domestic environment, there is the possibility of accidental ingestion by a child.

6.2. Human health effects assessment

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

Endpoint	*Result and Assessment Conclusion*
Rat, acute oral toxicity	oral LD50 >2000 mg/kg bw low toxicity
Rat, acute dermal toxicity	LD50 >2000 mg/kg bw low toxicity
Rabbit, skin irritation	moderately irritating
Human, skin irritation	non-irritating up to 100% concentration under the conditions of the test
Rabbit, eye irritation	slightly irritating
Mouse, skin sensitisation – Local lymph node assay	no evidence of sensitisation
Rat, repeat dose oral toxicity – 90 days.	NOAEL ≥ 1000 mg/kg bw/day
Mutagenicity – bacterial reverse mutation	non mutagenic
Genotoxicity – *in vitro* mammalian chromosome aberration test	non genotoxic

Toxicokinetics, metabolism and distribution

The substance is absorbed via the oral route as indicated by the changes in the urine in the 90 day repeated dose oral study (LPT 2006). Based on the low molecular weight (< 500 Da) dermal absorption of the notified chemical is expected to occur. However, due to the lipophilicity of the notified chemical (water solubility < 0.01 mg/l; log Pow = 9) the transfer from the stratum corneum into the epidermis is expected to be slow.

Acute toxicity

The notified chemical is considered to be of low acute toxicity via the oral and dermal routes based on tests conducted in rats.

Irritation and Sensitisation

Based on a test conducted in rabbits the notified chemical is considered to be slightly irritating to the eye. The notified chemical is not considered to be a skin sensitiser, based on the lack of lymphocyte proliferation in a modified murine local lymph node assay.

The notified chemical was found to be moderately irritating to rabbit skin in a test conducted in accordance with the OECD Guideline 404. After 4 hours exposure the mean erythema scores (based on the 24, 48 and 72 hour observations) for the three animals tested were 2.0, 2.33 and 2.0. All effects were fully reversible within 14 days. A Human Patch Test was conducted on 22 subjects, who were exposed to the notified chemical for 48 hours at concentrations of 10%, 25%, 50% and 100%. No positive responses were observed in any subjects at any of the test concentrations.

Repeated Dose Toxicity (sub chronic)
In a 90 day study in rats no adverse treatment related health effects were observed at any dose level. Therefore the No Observed Adverse Effect Level (NOAEL) was established as ≥ 1000 mg/kg bw/day. As this was the highest dose tested the actual NOAEL may be greater than this.

Mutagenicity and genotoxicity
The notified chemical was negative in an Ames test and an *in vitro* mammalian chromosome aberration test. The notified chemical is not considered to be mutagenic or genotoxic.

Observations on Human Exposure
The notified chemical is currently being used overseas in cosmetic products, although the similarity of the overseas applications to the proposed applications is not known. The notifier has indicated that they are not aware of any adverse reactions from this use.

Classification
The weight of evidence for the dermal irritation potential, including a comparison of the quality of the data from the animal and human studies, indicates that the notified chemical is classified as an irritant under the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human health risk characterisation

6.3.1. Occupational health and safety
The highest occupational exposure to the notified chemical is expected to be to reformulation workers during handling of the drums, cleaning and maintenance of the equipment. Significant dermal exposure may also occur for hairdressers and/or beauticians using the finished cosmetic products (< 20% notified chemical).

Local effects
Although the notified chemical is considered to be an irritant, the exposure is expected to be minimised due to the use of personal protective equipment in the case of reformulation workers, and the lower concentrations (<20%) and good hygiene practices in the case of hairdressers/beauticians. Therefore the risk of irritant effects after exposure to the notified chemical is not considered to be an unacceptable risk.

Systemic effects
The notified chemical was found to have a NOAEL of ≥ 1000 mg/kg bw/day in the repeat dose 90 day oral toxicity study. Although oral exposure is expected to be low and is likely to be minimised further by good personal hygiene practices, potential for systemic exposure via the dermal route exists given the low molecular weight of the notified chemical. No NOAEL has been determined for the dermal route. EASE modelling of the reformulation processes estimated the exposure as 0-0.6 mg/kg/day. Use of the oral NOAEL results in an MOE (margin of exposure) of ≥ 1667. The MOE is based on conservative assumptions, including no use of PPE, 100% dermal absorption and a NOAEL set at the highest dose level tested. It may therefore overestimate the risk. An MOE greater than or equal to 100 is considered acceptable to account for intra- and inter-species differences. This MOE therefore indicates that the risk to workers from exposure to the notified chemical would not be considered unacceptable.

6.3.2. Public health
The general public will be repeatedly exposed to the notified chemical via a number of different consumer products, applied to the skin.

Local effects
The notified chemical was shown to have skin irritancy effects. However at the concentrations used in the large majority of consumer products (typically 3-10%) the notified chemical is unlikely to produce irritation. For moisturisers with secondary sunscreens a concentration of up to 20% is used. However, given the

relatively mild effects seen in the animal study (the erythema scores indicate that the notified chemical would be classified as a 'mild irritant' under the proposed GHS classification scheme (United Nations 2003)), and the absence of irritation effects seen in the human patch test study, the risk of irritancy effects in consumers is not considered to constitute an unacceptable risk.

Systemic effects
In a worse case scenario, in moisturisers with secondary sunscreens, the exposure is estimated to be 27 mg/kg bw/day. However, the notifier has stated that the use of the notified chemical in secondary sunscreens will not be a typical application. Therefore, in the scenario where the notified chemical is used in body lotions the exposure is estimated to be 13 mg/kg bw/day. Use of the NOAEL from the repeat dose 90 day oral toxicity study results in an MOE (margin of exposure) of ≥ 37 and ≥ 77 for use in moisturisers with secondary sunscreens and body lotions respectively. An MOE greater than or equal to 100 is considered acceptable to account for intra- and inter-species differences. The MOE is based on conservative assumptions and may overestimate the risk. In particular in this case the NOAEL used is based on the highest level tested in the repeat dose study. As no adverse effects were observed in this study no specific concerns for systemic toxicity have been identified. In addition, due to the lack of measured data for the dermal absorption the dermal absorption has been assumed to be 100% based on the low molecular weight. However, the actual absorption may be less than this. Therefore, although the margin of exposure as calculated is low due to the high concentrations used, the risk of systemic effects to the public from the use of products containing the notified chemical is not considered to be unacceptable.

Any one off ingestion of the notified chemical is unlikely to pose a risk due to the low acute oral toxicity of the notified chemical.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1 Environmental Exposure

RELEASE OF CHEMICAL AT SITE
The notified chemical is imported and stored in a warehouse prior to delivery to the customer for reformulation at the proposed 5 sites. No release is anticipated at the notifier's storage facility and during distribution and transportation to customer sites, except in the event of an accident. In the event of a transport accident, the notified chemical in sealed containers would limit the release to the environment. Accidental spills of the notified chemical will be contained and the spilled chemical adsorbed on an inert support and disposed of to landfill.

Reformulation of the imported product into consumer products will be by the batch process where cleaning the blending equipment may result in the generation of waste waters containing the notified chemical. It is expected that most sites will have closed, automated mixing and dosing equipment. It is also expected that cleaning residues will be filled off as a "heel" for charging into the first batch of the next campaign. The quantity of notified chemical remaining in the emptied import containers may be up to 0.3% of the import volume. The empty drums after rinsing would be sent to drum recycler.

RELEASE OF CHEMICAL FROM USE
The notified chemical will be used in skin-care or hair-care products. In these applications, it is anticipated that the entire product is eventually washed into the sewer system. The majority of the imported notified chemical (>98%) is therefore expected to be disposed of to sewers.

RELEASE OF CHEMICAL FROM DISPOSAL
It is anticipated that up to 0.4% of the notified chemical will be lost as residues in consumer containers, which are primarily sent to landfill or recycled.

7.1.2 Environmental fate

The notified chemical is very slightly soluble in water and does not undergo hydrolysis at the environmental pH range of 4-9. It is considered to be moderately volatile. Its high log Kow of 6 and log Koc of 4.8 indicate that it is likely to partition to the soil or sediment. The notified chemical is considered to be readily biodegradable. In landfill, the residue in the sludge is expected to degrade slowly by abiotic and biotic processes to oxides of carbon and water. For the details of the environmental fate studies please refer to Appendix C.

7.1.3 Predicted Environmental Concentration (PEC)

It is anticipated that essentially all of the notified chemical will be released into the sewer system from the wash-off of products containing the chemical in domestic applications. As the notified chemical is to be used domestically, it is anticipated that release will occur on 365 days per year across Australia. The mitigated PEC arising from this domestic release pattern was modelled using the SIMPLETREAT approach (EC, 2003). Removal within STP is based on the water solubility of 0.01 mg/L, log H of 2.658 Pa/m^3/mol (based on the water solubility and vapour pressure of 1.6 x 10^{-2} Pa), log Kow of 6 and a molecular weight of < 500 Da for the notified chemical. The details of the PEC calculation with mitigation from STP removal are presented below:

Predicted Environmental Concentration (PEC) for the Aquatic Compartment		
Total Annual Import/Manufactured Volume	10,000	kg/year
Proportion expected to be released to sewer	100%	
Annual quantity of chemical released to sewer	10,000	kg/year
Days per year where release occurs	365	days/year
Daily chemical release:	27.4	kg/day
Water use	200.0	L/person/day
Population of Australia (Millions)	21.2	million
Removal within STP	96%	
(a) Volatilisation	15%	
(b) Degradation	12%	
(c) Partition to sludge	69%	
(d) Remain in effluent	4%	
Daily effluent production:	4,232	ML
Dilution Factor - River	1.0	
Dilution Factor - Ocean	10.0	
PEC - River:	0.26	µg/L
PEC - Ocean:	0.026	µg/L

Partitioning to biosolids in STPs Australia-wide may result in an average biosolids concentration of 45 mg/kg (dry wt). Biosolids are applied to agricultural soils, with an assumed average rate of 10 t/ha/year. Assuming a soil bulk density of 1300 kg/m^3 and a soil-mixing zone of 10 cm, the concentration of the notified chemical may approximate 0.34 mg/kg in applied soil. This assumes that degradation of the notified chemical occurs in the soil within 1 year from application. Assuming accumulation of the notified chemical in soil for 5 and 10 years under repeated biosolids application, the concentration of notified chemical in the applied soil in 5 and 10 years may approximate 1.7 mg/kg and 3.4 mg/kg, respectively.

STP effluent re-use for irrigation occurs throughout Australia. The agricultural irrigation application rate is assumed to be 1000 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 1300 kg/m^3). Using these assumptions, irrigation with a concentration of 0.26 µg/L may potentially result in a soil concentration of approximately 2.0 µg/kg. Assuming accumulation of the notified chemical in soil for 5 and 10 years under repeated irrigation, the concentration of notified chemical in the applied soil in 5 and 10 years may be approximately 10 µg/kg and 20 mg/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 LL50 > 4.0 mg/L	Non-toxic up to limit of water solubility
Daphnia Toxicity	48 EL50 = 4.0 mg/L	Toxic
Algal Toxicity	72 h EC50 >100 mg/L (WAF)	At worst harmful
Inhibition of Bacterial Respiration	3 h EC50 >100 mg/L	Not harmful

The predicted No-Effect Concentration was calculated from the most sensitive end point of EC50 = 4.0 mg/L for daphnia. As the results are available for three trophic levels, the assessment factor of 100 has been used.

7.2.1 Predicted No-Effect Concentration

Predicted No-Effect Concentration (PNEC) for the Aquatic Compartment		
EC50 for Daphnia	4.0	mg/L
Assessment Factor	100	
Mitigation Factor	1.00	
PNEC:	40	µg/L

7.3. Environmental risk assessment

Risk Assessment	PEC µg/L	PNEC µg/L	Q
Q - River	0.26	40	0.007
Q - Ocean	0.026	40	0.0007

The mitigated Risk Quotients are <1 for both the river and ocean disposal scenarios. Therefore, the notified chemical is not expected to pose an unacceptable risk to the aquatic environment based on the current use pattern and the maximum import volume of 10 tonnes/year.

8. CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
Based on the available data the notified chemical is classified as hazardous under the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)]. The classification and labelling details are:

Xi: R38 Irritating to skin

and

As a comparison only, the classification of the notified chemical using the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS) (United Nations 2003) is presented below. This system is not mandated in Australia and carries no legal status but is presented for information purposes.

	Hazard category	***Hazard statement***
Environment	Acute II	Toxic to aquatic life
Skin irritation	Category 3	Causes mild skin irritation

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

When used in the proposed manner, the notified chemical is not considered to pose an unacceptable 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 a risk to the environment.

Recommendations

REGULATORY CONTROLS
Hazard Classification and Labelling

- The Office of the ASCC, Department of Employment and Workplace Relations (DEWR), should consider the following health hazard classification for the notified chemical:
  - Xi: R38 Irritating to skin

- Use the following risk phrases for products/mixtures containing the notified chemical:
  - ≥ 20%: risk phrases Xi: R38 Irritating to skin

- The following safety phrases should appear on the MSDS and label for the notified chemical:
  - S24: Avoid contact with skin
  - S37: Wear suitable gloves

Material Safety Data Sheet

- The MSDS provided by the notifier should be amended as follows:
  - In section 15 Regulatory information the risk phrase R38 Irritating to skin should be added.

CONTROL MEASURES
Occupational Health and Safety

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical:
  - Avoid skin contact

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical:
  - Safety goggles or face shield, impervious gloves and protective clothing

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

- A copy of the MSDS should be easily accessible to employees.

- If products and mixtures containing the notified chemical are classified as hazardous to health in accordance with the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)] workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Disposal

- The notified chemical should be disposed of to landfill.

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 chemical in cosmetic products exceeds 20%.

or

(2) Under Section 64(2) of the Act; if
- the function or use of the chemical has changed from a component of cosmetic products, or is likely to change significantly;
- the amount of chemical being introduced has increased from 10 tonnes, or is likely to increase, significantly;
- if 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 MSDS of the notified chemical provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Melting Point/Freezing Point -38.9ºC

Method OECD TG 102 Melting Point/Melting Range.
Remarks No significant protocol deviations. GLP compliant.
Up to a temperature of 400 ºC there was no thermal decomposition.
Test Facility Bayer Industry Services (2006a)

Boiling Point 319ºC at 101.3 kPa

Method OECD TG 103 Boiling Point.
Remarks No significant protocol deviations. GLP compliant.
The boiling point was determined using differential thermal analysis with the sample heated at 5 ºC/min.
Test Facility Bayer Industry Services (2006a)

Density 858.9 kg/m^3 at 20ºC

Method OECD TG 109 Density of Liquids and Solids.
Remarks No significant protocol deviations. GLP compliant.
The relative density was determined using an oscillating densimeter, with the instrument calibrated using normal oil 10 AW sr.24.
Test Facility Bayer Industry Services (2006a)

Vapour Pressure 1.6×10^{-5} kPa at 25ºC

Method OECD TG 104 Vapour Pressure.
Remarks No significant protocol deviations. GLP compliant.
The vapour pressure was calculated at different temperatures using the gas saturation method and the value for 25ºC was interpolated by use of the Antoine equation.
Test Facility Bayer Industry Services (2006a)

Water Solubility <0.01 mg/L at 20ºC

Method OECD TG 105 Water Solubility.
Remarks No significant protocol deviations. GLP compliant.
The water solubility was determined by the Column Elution Method. The concentrations of the test substance in the fractions were measured by GC/EI/MS. Fractions from both columns were analysed to have mean concentrations <0.01 mg/L at pH 6.6-6.8.
Test Facility Bayer Industry Services (2006b)

Hydrolysis as a Function of pH $t_{1/2}$ = 3155 h at pH 7 and 25ºC

Method OECD TG 111 Hydrolysis as a Function of pH.

pH	*T (°C)*	*$t_{½}$ hours*
4	25	7569
7	25	3155
9	25	5513

Remarks No significant protocol deviations. GLP compliant. All preparations were performed with concentrations of 0.5 mg/L. Acetonitrile was added to solubilise the test substance. These preparations were shaken in a water bath at 50, 70 and 80ºC.
Test Facility Bayer Industry Services (2006c)

Partition Coefficient (n-octanol/water) log Pow = 9 (beyond the maximum value of log Kow = 6.19 of the calibration range)

Method OECD TG 117 Partition Coefficient (n-octanol/water).

Remarks	GLP compliant. The partition coefficient of the test substance was determined by HPLC Method. The test substance and the reference substances were dissolved in the mobile phase and the retention times were determined and graphed using linear regression method. The test substance was eluted beyond the calibration range.
Test Facility	Bayer Industry Services (2006d)

Adsorption/Desorption $\log K_{oc} = 4.8$

Method	OECD TG 121 for estimation of the adsorption coefficient on soil and sewage sludge using HPLC
Remarks	No significant protocol deviations. GLP compliant. The adsorption coefficient of the test substance was determined by HPLC Method. The test substance and the reference substances were dissolved in the mobile phase and the retention times were determined and graphed using linear regression method. The test substance was eluted beyond the maximum value of log Koc = 4 for the calibration standards.
Test Facility	Bayer Industry Services (2006e)

Flash Point 160°C at 101 kPa

Method	EC Directive 92/69/EEC A.9 Flash Point.
Remarks	No significant protocol deviations. GLP compliant.
Test Facility	Bayer Industry Services (2006f)

Autoignition Temperature 235°C

Method	EC Directive 92/69/EEC A.15 Auto-Ignition Temperature (Liquids and Gases).
Remarks	No significant protocol deviations. GLP compliant.
Test Facility	Bayer Industry Services (2006c)

Explosive Properties Not explosive

Method	EC Directive 92/69/EEC A.14 Explosive Properties.
Remarks	No significant protocol deviations. GLP compliant. No changes in the notified chemical were seen in the drop-weight test and steel cartridge test. The notified chemical was not tested in the friction mill as this test is only applicable for solids.
Test Facility	Bayer Industry Services (2006c)

APPENDIX B: TOXICOLOGICAL INVESTIGATIONS

B.1. Acute toxicity – oral

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 423 Acute Oral Toxicity – Acute Toxic Class Method.
Species/Strain	Rat/SPF Wistar Crl:WI
Vehicle	Corn oil; test substance administered as a solution
Remarks - Method	No significant protocol deviations. GLP compliant.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw*	*Mortality*
I	3 Female	2000	0
II	3 Female	2000	0

LD50	>2000 mg/kg bw
Signs of Toxicity	All animals showed a hunched posture and piloerection for 6 hours after application of the test item. All animals recovered and from day 1 until the end of the observation on day 14 no signs of toxicity were noted.
Effects in Organs	There were no remarkable necropsy findings.
Remarks - Results	Normal bodyweight gain was seen throughout the course of the study.
CONCLUSION	The notified chemical is of low toxicity via the oral route.
TEST FACILITY	Frey-Tox (2006a)

B.2. Acute toxicity – dermal

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 402 Acute Dermal Toxicity – Limit Test.
Species/Strain	Rat/Wistar
Vehicle	Test substance administered as supplied.
Type of dressing	Semi-occlusive.
Remarks - Method	No significant protocol deviations. GLP compliant.

RESULTS

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

LD50	>2000 mg/kg bw
Signs of Toxicity - Local	There were no test substance-related dermal reactions reported. It is not clear from the study report whether any scoring of dermal reactions was carried out.
Signs of Toxicity - Systemic	There were no deaths or test-substance related clinical signs. All animals were considered to have achieved satisfactory bodyweight gains throughout the study.
Effects in Organs	One female rat from the control group had minimal consolidation of the left lobe of the lungs and one female rat from the treatment group had minimal consolidation of the right cranial and middle lobes of the lungs.
Remarks - Results	The consolidation seen in the lungs of the rats in the control and treatment group were mild in nature and comparable and hence could be considered

as spontaneous and incidental findings unrelated to treatment.

CONCLUSION The notified chemical is of low toxicity via the dermal route.

TEST FACILITY Jai Research Foundation (2006)

B.3. Irritation – skin

TEST SUBSTANCE

METHOD OECD TG 404 Acute Dermal Irritation/Corrosion.
EC Directive 2004/73/EC B.4 Acute Toxicity (Dermal Irritation/Corrosion).

Species/Strain	Rabbit/SPF albino Chbb:HM
Number of Animals	3 Female
Vehicle	Test substance administered as supplied.
Observation Period	14 days
Type of Dressing	Semi-occlusive.
Remarks - Method	A first test produced contradictory results so a second test was conducted. A 4 hour exposure time was chosen for the second test. Although the treated skin was cleaned with soap and lukewarm water after exposure, the test item seemed to leave a slight oil film on the skin. No significant protocol deviations. GLP compliant.

RESULTS

Lesion	*Mean Score* Animal No.*			*Maximum Value*	*Maximum Duration of Any Effect*	*Maximum Value at End of Observation Period*
	1	2	3			
Erythema/Eschar	2	2.33	2	3	7 days	0
Oedema	0.33	1	0	1	7 days	0

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

Remarks - Results Seven days after termination of exposure two animals showed scales on the whole right anterior test field while the third animal had only isolated scales on the right anterior test field. Fourteen days after termination of exposure all animals showed no signs of irritation.

CONCLUSION The notified chemical is moderately irritating to the skin.

TEST FACILITY Frey-Tox (2006b)

B.4. Dermal irritation – human volunteers

TEST SUBSTANCE Notified chemical

METHOD Range finding (48 Hour Patch Test). Protocol No.: 1.02.
In house method.
No positive or negative controls were used.

Study Design The test material was diluted to 10, 25 and 50% concentrations. Approximately 0.2 mL of each dilution as well as the undiluted material was applied to an absorbent pad (1.9 × 1.9 cm) portion of an adhesive dressing (for the undiluted sample this equates to an applied concentration of 47.6 mg/cm^2). The secured dressings formed an occlusive patch when secured to the treatment site. The test material remained in contact with the skin for 48 hours before the dressings were removed and the treatment sites evaluated. The treatment sites were also evaluated 72 hours after application.

Study Group	Twenty-three subjects, three male and twenty female, ranging in age from 34 to 78 years. Twenty-two completed the study.
Vehicle	Mineral oil; test substance applied as a solution and as the neat liquid.
Remarks - Method	Not GLP compliant. Conducted with adherence to ICH Guideline E6 for Good Clinical Practice. There are currently no internationally accepted guidelines for human irritation studies. An outline protocol has been published by ECETOC (2002). Compared to this protocol the following is noted for the current test: – The recommended ratio of male to female volunteers was not met. – The minimum test concentration (50 mg/cm^2) was not met due to the density of the test material, but was close (47.6 mg/cm^2). – The application site was not identified in the study report. One subject discontinued for reasons unrelated to the test material.

RESULTS

Remarks - Results	Observations of all treated areas remained negative throughout the test.

CONCLUSION	A dermal irritation test was conducted using the notified chemical diluted with mineral oil to 10, 25, 50% and undiluted under an occlusive dressing. The notified chemical was non-irritating under the conditions of the test.
TEST FACILITY	Consumer Product Testing (2006)

B.5. Irritation – eye

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 405 Acute Eye Irritation/Corrosion. EC Directive 2004/73/EC B.5 Acute Toxicity (Eye Irritation).
Species/Strain	Rabbit/SPF Chbb:HM
Number of Animals	3 Female
Observation Period	7 days
Remarks - Method	No significant protocol deviations. GLP compliant.

RESULTS

Lesion	*Mean Score* Animal No.*			*Maximum Value*	*Maximum Duration of Any Effect*	*Maximum Value at End of Observation Period*
	1	2	3			
Conjunctiva: redness	1.33	0.67	0.67	2	< 7 days	0
Conjunctiva: chemosis	1	0.33	0.33	2	< 72 hours	0
Conjunctiva: discharge	0	0	0	0	0	0
Corneal opacity	0	0	0	0	0	0
Iridial inflammation	0	0	0	0	0	0

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

Remarks - Results	Slight conjunctival irritation was observed in all animals at one-hour after application, increasing to a more diffuse irritation response in one animal after 24 hours. All effects seen were reversible within seven days in one animal and 72 hours in the other two animals.
CONCLUSION	The notified chemical is slightly irritating to the eye.
TEST FACILITY	Frey-Tox (2006c)

B.6. Skin sensitisation – mouse local lymph node assay (LLNA)

TEST SUBSTANCE	Notified chemical
METHOD	Adaptation of OECD TG 429: Skin Sensitisation: Local Lymph Node Assay. The modified assay is known as an Integrated Model for the Differentiation of Skin Reactions (IMDS).
Species/Strain	Mouse/SPF Hsd Win:NMRI
Vehicle	Corn oil; test substance administered as a solution
Remarks - Method	The assay was modified by measuring lymph node weights and cell counts instead of using radioactive labelling. Ear swelling was also measured after treatment to enable the discrimination of the irritating potential from the sensitising potential of the test substance. The IMDS assay has undergone an interlaboratory validation in Europe (Ehling et al 2005a and 2005b). The "positive" level determined for this mouse strain in the validation study is a cell count index of 1.4. GLP compliant.

RESULTS

Concentration	*Proliferative response*			*Irritant response*	
(% w/w)	*Lymph node weight (mg)*	*Cell counts (x 10^3/mL)*	*Stimulation index**	*Ear swelling index***	*Ear weight (mg/8mm punch)*
0	8.22	10106.67	1.00	1.00	13.28
2	8.77	12163.58	1.20	0.98	14.18
10	9.83	12770.42	1.26	1.00	14.14
50	9.22	11222.92	1.11	1.00	14.29

* Test/control ratio calculated using the cell counts.
** Test/control ratio calculated from changes in ear swelling measurements from day 4 compared to day 1.

Remarks - Results	Cell count determinations, body weight, ear swelling and ear weight of the animals treated with the test substance was not significantly different to the values for the control.
CONCLUSION	There was no evidence of induction of a lymphocyte proliferative response indicative of skin sensitisation to the notified chemical.
TEST FACILITY	Bayer HealthCare (2006)

B.7. Repeat dose toxicity

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents. EC Directive 2001/56/EC B.26 Sub-Chronic Oral Toxicity Test: 90-Day Repeated Oral Dose Study using Rodent Species.
Species/Strain	Rat/CD/Crl:CD(SD)
Route of Administration	Oral – gavage
Exposure Information	Total exposure days: 90 days Dose regimen: 7 days per week Post-exposure observation period: None
Vehicle	Test substance administered as a solution in soybean oil
Remarks - Method	No significant protocol deviations. No recovery period, however there were no toxic effects observed. GLP compliant.

RESULTS

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

Mortality and Time to Death

No test item mortality occurred during the study. However, four female animals died during laboratory examinations on the last day after blood withdrawal due to ether narcosis.

Clinical Observations

One female animal dosed with 100 mg/kg bw/day of the test substance showed moderate to severe increased drinking water consumption and diuresis from test day 40 onwards. The same animal showed pilo-erection from test day 72-78. As this was an isolated observation this was considered not to be test related. No other effects on behaviour or external appearance were observed in the treated animals.

Body weight changes and food consumption in the treated animals corresponded to that seen in the control animals.

The observation and functional screening did not reveal any test item related changes at any dose level.

No test item related changes in the oestrus cycle were found at any dose level.

No test item related effects on sperm count, viability or mobility were observed.

Laboratory Findings – Clinical Chemistry, Haematology, Urinalysis

No test item related changes were noted in the haematological parameters at any dose level.

No test item related changes were noted in the biochemical parameters at any dose level.

Male and female animals in the mid and high dose treatment groups showed a statistically significant decrease in the urinary pH value of between 5 and 11% which was considered to be related to treatment with the test item. The urinary specific gravity values for male rats in the mid dose group also showed a slight but statistically significant decrease, however, as it was not dose related it was considered to be unrelated to the test item.

Effects in Organs

Animals in the high dose treatment group showed a statistically significant increase in the absolute and relative liver weights. No other test related macroscopic or microscopic changes in the organs were noted.

Remarks – Results

The test related decrease in urinary pH is considered to be possibly due to an acidic metabolite of the test item eliminated at large doses via the urine. Therefore, in the absence of any observed effects on the kidney this is considered to be a non-adverse effect.

The changes in the liver weights were considered to be a non-specific adaptive change to the high workload of the liver at the maximum dose.

Therefore the NOAEL was established as greater than or equal to the maximum dose level.

CONCLUSION

The No Observed Adverse Effect Level (NOAEL) was established as ≥ 1000 mg/kg bw/day in this study based on the absence of adverse treatment related effects.

TEST FACILITY LPT (2006)

B.8. Genotoxicity – bacteria

TEST SUBSTANCE Notified chemical

METHOD Bacterial Reverse Mutation Test – in house method.
Plate incorporation procedure and pre incubation procedure

Species/Strain	*S. typhimurium*: TA1535, TA1537, TA98, TA100, TA102
Metabolic Activation System	S9 fraction derived from Aroclor 1254 induced rat liver
Concentration Range in Main Test	a) With metabolic activation: 0.31, 0.62, 1.25, 2.5 and 5.0 µL/plate b) Without metabolic activation: 0.31, 0.62, 1.25, 2.5 and 5.0 µL/plate

Vehicle	Dimethylsulfoxide; test substance diluted
Remarks - Method	In a preliminary toxicity study using each of the strains at three concentrations no toxicity was observed up to a concentration of 5.0 µL/plate. The method used was similar to OECD TG 471. GLP compliant.

RESULTS

Metabolic Activation	*Test Substance Concentration (µL/plate) Resulting in:*			
	Cytotoxicity in Preliminary Test	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Plate incorporation	>5	>5	>5	Negative
Pre incubation	>5	>5	>5	Negative
Present				
Plate incorporation	>5	>5	>5	Negative
Pre incubation	>5	>5	>5	Negative

Remarks - Results	No significant increases in the frequency of revertant colonies were recorded for any of the bacterial strains, either with or without metabolic activation. The positive and negative controls gave satisfactory responses, confirming the validity of the test system.

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

TEST FACILITY IIBAT (2006)

B.9. Genotoxicity – in vitro

TEST SUBSTANCE Notified Chemical

METHOD OECD TG 473 In vitro Mammalian Chromosome Aberration Test.
EC Directive 2000/32/EC B.10 Mutagenicity - In vitro Mammalian Chromosome Aberration Test.

Cell Type/Cell Line	Chinese hamster V79 lung fibroblasts
Metabolic Activation System	S9 fraction derived from Phenobarbital/β-napthoflavone induced rat liver.
Vehicle	Ethanol
Remarks - Method	No significant protocol deviations. GLP compliant. The maximum treatment concentration (2840 µg/mL) was chosen based on a preliminary toxicity study in which no cytotoxicity (evaluated by reductions in cell numbers) was observed up to this concentration. Test 1 without S9 mix was repeated due to missing genotoxicity in the positive control. Only the repeated results are shown below.

Metabolic Activation	*Test Substance Concentration (µg/mL)*	*Exposure Period*	*Harvest Time*
Absent			
Test 1	22.2, 44.4, 88.8*, 177.5*, 355*, 710, 1420 and 2480	4 hours	18 hours
Test 2a	44.4, 88.8*, 177.5*, 355*, 710, 1420 and 2480	18 hours	18 hours
Test 2b	44.4, 88.8*, 177.5*, 355*, 710, 1420 and 2480	28 hours	28 hours
Present			
Test 1	22.2, 44.4*, 88.8*, 177.5*, 355, 710, 1420 and 2480	4 hours	18 hours
Test 2	44.4*, 88.8*, 177.5*, 355, 710, 1420 and 2480	4 hours	28 hours

*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	88.8	>2840	355	Negative
Test 2		>2840	355	Negative
Present				
Test 1	>2840	>2840	177.5	Negative
Test 2		>2840	177.5	Negative

Remarks - Results

Although cytotoxicity was seen at 88.8 µg/mL in the absence of metabolic activity no cytotoxicity was seen at higher concentrations in this test.
In both experiments in the absence and presence of metabolic activation, no biologically relevant increase in the number of cells carrying structural chromosome aberrations was observed. Statistically significant increases in the number of cells carrying structural chromosome aberrations was observed in experiment II without metabolic activation. However, there was no clear dose response and the values were within the range of the historical control data.

CONCLUSION

The notified chemical was not clastogenic to Chinese hamster V79 lung fibroblasts treated in vitro under the conditions of the test.

TEST FACILITY

RCC (2006)

APPENDIX C: ENVIRONMENTAL FATE AND ECOTOXICOLOGICAL INVESTIGATIONS

C.1. Environmental Fate

C.1.1. Ready biodegradability

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 301 B Ready Biodegradability: CO2 Evolution Test.
Inoculum	Municipal wastewater treatment plant
Exposure Period	28 days
Auxiliary Solvent	None
Analytical Monitoring	TOC
Remarks - Method	No significant protocol deviations

RESULTS

Test substance		*Sodium benzoate*	
Day	*Mean % Degradation*	*Day*	*% Degradation*
3	20.9	3	67.8
7	59.7	7	84.5
10	67.7	10	88.9
14	72.3	14	87.9
21	75.8	21	95.0
28	75.1	28	88.2

Remarks - Results	The mean degradation of the test substance was 75.1% within 28 days after acidification. The test substance had met the 10 days window criterion for ready biodegradation on day 12. The reference substance reached the pass level for ready biodegradability within 3 days and thus validating the test.
CONCLUSION	The notified chemical is considered to be ready biodegradable.
TEST FACILITY	Hydrotox GmbH (2006)

C.1.2. Bioaccumulation

Based on the log K_{ow} of >6, the notified chemical has the potential to bioaccumulate, but the functional groups present would be expected to be metabolised.

C.2. Ecotoxicological Investigations

C.2.1. Acute toxicity to fish

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 203 Fish, Acute Toxicity Test - static. EC Directive 92/69/EEC C.1 Acute Toxicity for Fish - static
Species	Zebrafish (*Danio rerio*)
Exposure Period	96 h
Auxiliary Solvent	None
Water Hardness	72 mg $CaCO_3$/L
Analytical Monitoring	GCMS
Remarks – Method	No significant protocol deviations. Water accommodated fractions (WAF) were prepared by applying the test substance to test medium and shaking for 24 h at 20ºC. After phase separation, the homogeneous liquid phase was transferred to the glass aquarium. Volumes for test analysis were derived from the glass aquarium.

RESULTS

Concentration mg/L Nominal	*Number of Fish*	*Mortality*				
		2 h	*24 h*	*48 h*	*72 h*	*96 h*
Control	7	0	0	0	0	0
4	7	0	0	0	0	0

LL50	>4 mg/L at 96 hours.
NOEC	4 mg/L at 96 hours (nominal).
Remarks – Results	Temperatures, dissolved oxygen and pH were within acceptable limits. The test medium showed turbidity throughout exposure. The WAF of the test substance caused no mortality or non-lethal effects. The limit of quantitation (LOQ) was determined to be 1.20 µg/L. The measured initial loading of the test substance was within the acceptable value of the nominal. At the end of the test at 96 h the test substance was not detectable (<LOQ).
CONCLUSION	The notified chemical is considered to be non-toxic to fish up to lethal loading (LL) of 4 mg/L.
TEST FACILITY	Dr U Noack-Laboratorien (2006a)

C.2.2. Acute toxicity to aquatic invertebrates

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 202 Daphnia sp. Acute Immobilisation Test and Reproduction Test - static. EC Directive 92/69/EEC C.2 Acute Toxicity for Daphnia - static.
Species	*Daphnia magna*
Exposure Period	48 hours
Auxiliary Solvent	None
Water Hardness	160-180 mg $CaCO_3$/L
Analytical Monitoring	GCMS
Remarks - Method	No significant protocol deviations. Loading levels of the WAF in the concentration range of 0.625-20.0 mg/L were prepared from the stock solution. The stock solution was prepared by shaking for 24 h at room temperature. After a separation phase of at least 30 minutes, the WAFs were taken from the homogeneous liquid phase.

RESULTS

Concentration mg/L Nominal	*Number of D. magna*	*% Immobilised*	
		24 h	*48 h*
Control	20	0	0
0.625	20	0	0
1.25	20	0	0
2.50	20	20	25
5.0	20	60	60
10.0	20	100	100
20.0	20	100	100

EL50	4.01 mg/L at 48 hours (CI: 3.58-4.48 mg/L)
NOEC	1.25 mg/L (WAF) at 48 hours
Remarks - Results	Temperatures, dissolved oxygen and pH were within an acceptable range. At the loading levels of 2.50-20.0 mg/L the test substance was nearly clearly dissolved throughout exposure. Only at loading levels of 10.0 and

20.0 mg/L, a very small part of the test substance floated on the surface after 48 h. At loading levels of 0.625-1.25 mg/L the test substance was clearly dissolved throughout exposure. The concentrations of the solutions were based on measured values.

100% immobilisation was observed at a loading level of 10.0 mg/L at 48 h and 25% immobilisation was observed at a loading level of 2.50 mg/L. The 48 h EC50 value was calculated by sigmoidal dose-response regression.

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

TEST FACILITY Dr U Noack-Laboratorien (2006b)

C.2.3. Algal growth inhibition test

TEST SUBSTANCE Notified chemical

METHOD OECD TG 201 Alga, Growth Inhibition Test.
EC Directive 92/69/EEC C.3 Algal Inhibition Test.

Species	Alga (*Desmodesmus subspicatus*)
Exposure Period	72 hours
Concentration Range	Nominal: 100 mg/L
Auxiliary Solvent	None
Water Hardness	None
Analytical Monitoring	GCMS
Remarks - Method	No significant protocol deviations. The test was performed at a loading level of 100 mg/L. This was prepared by shaking a dispersion of 100 mg/L in dilution water for 24 h at 23ºC in brown glass flask. After a separation phase of 30 minutes, the WAFs were taken from the homogeneous liquid phase.

RESULTS

Biomass		*Growth*	
EbL50	*NOEC*	*ErL50*	*NOEC*
mg/L at 72 h	*mg/L*	*mg/L at 72 h*	*mg/L*
>100	100	>100	100

Remarks - Results Temperatures and pH were within the acceptable limits. The measured initial loading of 15 mg/L had decreased to 10.9 mg/L by the end of the study. No inhibiting effects on biomass growth and specific growth rate were found in the WAF of 100 mg/L. The EbC50 and ErC50 for the reference potassium dichromate were within the acceptable range.

CONCLUSION The notified chemical is at worst harmful to alga.

TEST FACILITY Dr U Noack-Laboratorien (2006c)

C.2.4. Inhibition of microbial activity

TEST SUBSTANCE Notified chemical

METHOD OECD TG 209 Activated Sludge, Respiration Inhibition Test.

Inoculum	Sewage treatment plant
Exposure Period	3 hours
Concentration Range	Nominal: 100 mg/L

Remarks – Method	No significant protocol deviations. A nominal concentration of 100 mg/L was used in the test. This was prepared using WAF with a nominal concentration of 176 mg/L. The test substance was added to a brown glass flask with a tap at the bottom. The flask was then filled with deionised water and the content was stirred for 24 h at 20ºC. After stirring the content was left to settle for 1.5 h. The aqueous phase was then drawn off for testing.

RESULTS

IC50	>100 mg/L
NOEC	100 mg/L
Remarks – Results	The respiration rate of the activated sludge incubated with the test substance was found to be 25.4 mg O_2/L after 3 h. This was found to be in the range of the control assays of 21.1-23.8 mg O_2/L. There was no inhibitory effect of the test substance on the respiration rate. The EC50 of the reference substance 3,5-dichlorophenol was found to be within the acceptable range and thus validating the test.
CONCLUSION	The notified chemical is considered to be practically non-toxic to micro-organisms.
TEST FACILITY	Fraunhofer-Institute for Molecular Biology and Applied ecology (2006)

BIBLIOGRAPHY

Bayer HealthCare (2006) Local Lymph Node Assay in Mice (LLNA/IMDS) (Study No., T1076666, 16 August 2006), Wuppertal, Germany, Bayer HealthCare AG (Unpublished report submitted by Cognis Australia Pty Ltd).

Bayer Industry Services (2006a) Physicochemical Properties (Study No., 2006/0086/04, 18 September 2006), Leverkusen, Germany, Bayer Industry Services GmbH & OHG (Unpublished report submitted by Cognis Australia Pty Ltd).

Bayer Industry Services (2006b) Water Solubility and Identity (Study No., 2006/0086/01, 10 September 2006), Leverkusen, Germany, Bayer Industry Services GmbH & OHG (Unpublished report submitted by Cognis Australia Pty Ltd).

Bayer Industry Services (2006c) Abiotic degradation (Study No., 2006/0086/02, 19 September 2006), Leverkusen, Germany, Bayer Industry Services GmbH & OHG (Unpublished report submitted by Cognis Australia Pty Ltd).

Bayer Industry Services (2006d) Partition coefficient (n-octanol/water) (Study No., 2006/0086/05, 10 September 2006), Leverkusen, Germany, Bayer Industry Services GmbH & OHG (Unpublished report submitted by Cognis Australia Pty Ltd).

Bayer Industry Services (2006e)Adsoprtion/desorption (Study No., 2006/0086/03, 5 September 2006), Leverkusen, Germany, Bayer Industry Services GmbH & OHG (Unpublished report submitted by Cognis Australia Pty Ltd).

Bayer Industry Services (2006f) Determination of Safety-Relevant Data of C-SAT 060018 (Study No., 2006/01367, 05 October 2006), Leverkusen, Germany, Bayer Industry Services GmbH & OHG (unpublished report submitted by Cognis Australia Pty Ltd).

Consumer Product Testing (2006) Range Finding (48 Hour Patch Test), Protocol No.: 1.02 (Study No., C06-0899.01-.04, 10 December 2006), New Jersey, United States of America, Consumer Product Testing Co. (unpublished report submitted by Cognis Australia Pty Ltd).

Dr U Noack-Laboratorien (2006a) Fish (Zebrafish), acute toxicity test, static, 96 h. Study No. FAZ108301, Käthe-Paulus-Str. 1, Sarstedt (unpublished report).

Dr U Noack-Laboratorien (2006b) Acute immobilization test static, 48 h to *Daphnia magna* Study No. DAI108302, Käthe-Paulus-Str. 1, Sarstedt (unpublished report).

Dr U Noack-Laboratorien (2006c) Alga, growth inhibition test with *Desmodesmus subspicatus* Study No. SSO108302, Käthe-Paulus-Str. 1, Sarstedt (unpublished report).

EC (2003) Technical Guidance Document on Risk Assessment in support of Commission Directive 93/67/EEC on risk assessment for new notified substances, Commission Regulation (EC) No 1488/94 on risk assessment for existing substances, PART II.

ECETOC (2002) Use of Human Data in Hazard Classification for Irritation and Sensitisation. Brussels, Belgium, European Centre for Ecotoxicology and Toxicology of Chemicals (Monograph No. 32).

Ehling G., Hecht M., Heusener A., Huesler J., Gamer A. O., van Loveren H., Maurer T., Riecke K., Ullmann L., Ulrich P., Vandebriel R. and Vohr H.-W. (2005a) An European Inter-Laboratory Validation of Alternative Endpoints of the Murine Local Lymph Node Assay. 1st Round. Toxicology, **212**: 60-68.

Ehling G., Hecht M., Heusener A., Huesler J., Gamer A. O., van Loveren H., Maurer T., Riecke K., Ullmann L., Ulrich P., Vandebriel R. and Vohr H.-W. (2005b) An European Inter-Laboratory Validation of Alternative Endpoints of the Murine Local Lymph Node Assay. 2nd Round. Toxicology, **212**: 69-79.

FORS (Federal Office of Road Safety) (1998) Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code), 6th Edition, Canberra, Australian Government Publishing Service.

Frey-Tox (2006a) Acute Oral Toxicity Study in the Rat (Study No., 02908, 8 November 2006), Herzberg, Germany, Frey-Tox GmbH (unpublished report submitted by Cognis Australia Pty Ltd).

Frey-Tox (2006b) Skin Irritation Study in the Rabbit (Study No., 02850, 13 October 2006), Herzberg, Germany, Frey-Tox GmbH (unpublished report submitted by Cognis Australia Pty Ltd).

Frey-Tox (2006c) Acute Eye Irritation Study in the Rabbit (Study No., 02851, 15 September 2006), Herzberg, Germany, Frey-Tox GmbH (unpublished report submitted by Cognis Australia Pty Ltd).

Fraunhofer-Institute for Molecular Biology and Applied Ecology (2006) Respiration inhibition – Limit test (following OECD 209). GLP code: COG-012/3-09, Schmallenberg-Grafschaft (unpublished report).

Hydrotox GmbH (2006) Biodegradability in the CO_2-evolution test according to OECD 301B (July 1992). Report No. 409, Freiburg, Detschland (unpublished report).

IIBAT (2006): Mutagenicity Evaluation by Ames *Salmonella typhimurium* – Reverse Mutation Assay (Study No., 06128, 31 July 2006), Tamil Nadu, India, International Institute of Biotechnology and Toxicology (IIBAT) (unpublished report submitted by Cognis Australia Pty Ltd).

Jai Research Foundation (2006): Acute Dermal Toxicity Study in Rats (Study No., 6220, 06 October 2006), Gujarat, India, Jai Research Foundation (unpublished report submitted by Cognis Australia Pty Ltd).

LPT (2006): Repeated Dose 90-Day Oral Toxicity Study in Rats (Study No., 19934/06, 03 November 2006), Dusseldorf, Germany, LPT Laboratory of Pharmacology and Toxicology GmbH & Co. KG (unpublished report submitted by Cognis Australia Pty Ltd).

NOHSC (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (2003) National Code of Practice for the Preparation of Material Safety Data Sheets, 2nd edition [NOHSC:2011(2003)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (2004) Approved Criteria for Classifying Hazardous Substances, 3rd edition [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

RCC (2006): *In vitro* Chromosome Abberation Test in Chinese Hamster V79 Cells (Study No., 1026303, 14 November 2006), Rossdorf, Germany, Cytotest Cell Research GmbH (RCC-CCR) (unpublished report submitted by Cognis Australia Pty Ltd).

SCCP (2006) The SCCP's Notes of Guidance for the Testing of Cosmetic Ingredients and their Safety Evaluation 6th Revision, adopted by the SCCP during the 10th plenary meeting of 19 December 2006.

United Nations (2003) Globally Harmonised System of Classification and Labelling of Chemicals (GHS). United Nations Economic Commission for Europe (UN/ECE), New York and Geneva.