File No: LTD/1716

March 2014

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

2-Isopropyl-N,2,3-trimethylbutyramide (INCI name: methyl diisopropyl propionamide)

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 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.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This 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:	Level 7, 260 Elizabeth Street, SURRY HILLS NSW 2010, 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

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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
LTD/1716	Procter & Gamble Australia Pty Ltd	2-Isopropyl-N,2,3-trimethylbutyramide (INCI name: methyl diisopropyl propionamide)	Yes	1 tonne per annum	Component of toothpastes, mouthwashes and dental floss

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
Based on the available information, the notified chemical is recommended for hazard classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia. The recommended hazard classification is presented in the table below.

Hazard classification	*Hazard statement*
Acute toxicity, oral (Category 4)	H302: Harmful if swallowed

Based on the available information, the notified chemical is recommended for hazard classification according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004) with the following risk phrase:

R22: Harmful if swallowed

The environmental hazard classification according to the Globally Harmonised System for the 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 3	H402 - Harmful 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.

When used in the proposed manner and at the proposed concentrations, 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

REGULATORY CONTROLS

Hazard Classification and Labelling

- The notified chemical should be classified as follows:
  - H302: Harmful if swallowed

The above should be used for products/mixtures containing the notified chemical, if applicable, based on the concentration of the notified chemical present and the intended use/exposure scenario.

CONTROL MEASURES

Occupational Health and Safety

- 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 for the 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.

Disposal

- The notified chemical should be disposed of to landfill.

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 importation volume exceeds one tonne per annum notified chemical;
- the notified chemical is introduced in products other than toothpastes, mouthwashes, or dental floss;
- the concentration of the notified chemical exceeds or is intended to exceed 0.052% in toothpastes, 0.009% in mouthwashes or 0.045 mg/inch of floss in dental floss;

or

(2) Under Section 64(2) of the Act; if
- the function or use of the chemical has changed from a component of toothpastes, mouthwashes and dental floss, 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 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)
Procter & Gamble Australia Pty Ltd (ABN: 91 008 396 245)
Level 4, 1 Innovation Road
MACQUARIE PARK NSW 2113

NOTIFICATION CATEGORY
Limited-small volume: Chemical other than polymer (1 tonne or less 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: flash point, flammability, autoignition temperature, explosive properties and oxidising properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
WS-23

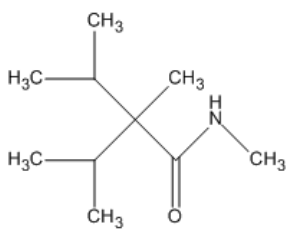
CAS NUMBER
51115-67-4

CHEMICAL NAME
2-Isopropyl-N,2,3-trimethylbutyramide

OTHER NAMES
Methyl Diisopropyl Propionamide (INCI)
Butanamide, N,2,3-Trimethyl-2-(1-Methylethyl)-
2-isopropyl-N,2,3-trimethylbutanamide
N,2,3-Trimethyl-2-(1-Methylethyl)Butanamide
N,2,3-Trimethyl-2-isopropylbutanamide
Cooling Sensate WS 23
Winsense WS-23

MOLECULAR FORMULA
$C_{10}H_{21}NO$

STRUCTURAL FORMULA



MOLECULAR WEIGHT
171.28

ANALYTICAL DATA
Reference GC-MS spectrum was provided.

3. COMPOSITION

DEGREE OF PURITY
≥ 99%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: white powder

Property	Value	Data Source/Justification
Melting Point	62.2 °C	Measured
Boiling Point	251.8 °C at 101.7 kPa	Measured
Density	1,010 kg/m^3 at 21 ± 0.5 °C	Measured
Vapour Pressure	6.0 × 10^{-4} kPa at 25 °C	Measured
Water Solubility	7.0 g/L at 20 °C	Measured
Hydrolysis as a Function of pH	Half-life > 1 year (pH 4-9)	Measured
Partition Coefficient (n-octanol/water)	log Pow = 2.23	Measured
Adsorption/Desorption	log K_{oc} = 1.67	Measured
Dissociation Constant	Not determined	No dissociable functionality
Particle Size	Inhalable fraction (< 100 μm): 21.7% Respirable fraction (< 10 μm): 1.18%	Measured
Flash Point	100 °C (Tag closed cup)	(M)SDS
Flammability	Not determined	Not expected to be highly flammable based on the flash point
Autoignition Temperature	Not determined	Not expected to undergo autoignition based on the structure of the notified chemical
Explosive Properties	Not determined	Contains no functional groups that imply explosive properties
Oxidising Properties	Not determined	Contains no functional groups that imply oxidative properties

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 for the 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 be imported into Australia as a component of finished oral hygiene products including toothpastes, mouthwashes and dental floss.

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

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

PORT OF ENTRY
Sydney by sea and air

IDENTITY OF MANUFACTURER/RECIPIENTS
Manufacture: Renessenz LLC (USA)
Recipient: Procter & Gamble Australia Pty Ltd

TRANSPORTATION AND PACKAGING
The notified chemical will be imported as a component in finished oral hygiene products including toothpastes, mouthwashes and dental floss in tubes/containers suitable for retail sale and will be transported in the same form in which they are imported.

USE
The notified chemical will be used as a flavouring ingredient in toothpastes (at up to 0.052% concentration) and mouthwashes (at 0.009% concentration), and in coatings for dental floss (at up to 0.045 mg/inch of floss).

OPERATION DESCRIPTION
The notified chemical will be imported into Australia as a component of finished oral hygiene products including toothpastes (at up to 0.052% concentration), mouthwashes (at 0.009% concentration) and dental floss (at up to 0.045 mg/inch of floss), which will be sold to end-users (the public) in the same form in which they are imported.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure
Transport storage and retail workers may come into contact with the notified chemical only in the event of accidental rupture of packages.

6.1.2. Public Exposure
There will be widespread and repeated exposure of the public to the notified chemical (at up to 0.052% concentration in toothpastes, at 0.009% concentration in mouthwashes and at up to 0.045 mg/inch on dental floss) through the use of oral hygiene products. The principal routes of exposure will be oral and dermal, while accidental ocular exposure is also possible.

Data on typical use patterns of oral hygiene products in which the notified chemical is proposed to be used are shown in the following tables for young children (2-4 year olds) and adults, respectively. The use of toothpaste is separately estimated for young children, as they represent a more susceptible receptor group. For the purposes of the exposure assessment, Australian use patterns for the product categories are assumed to be similar to those in Europe. In addition, 100% systemic exposure has been assumed based on buccal and/or gastrointestinal absorption. Using these data, the total systemic exposure is estimated to be 0.0444 mg/kg bw/day notified chemical for young children and 0.0209 mg/kg bw/day for adults.

The contribution to dermal exposure from the proposed product categories is considered negligible due to the low concentrations of the notified chemical in these products and has therefore not been included in the exposure calculations.

Children's exposure (2-4 year old)

Product type	Amount (mg/day)	C (%)	RF	Daily systemic exposure (mg/kg bw/day)
Toothpaste[1]	1720	0.052	0.62[2]	**0.0444**

C = concentration (%); RF = retention factor; assumed brushing twice daily
Daily systemic exposure = (Amount × C(%) × RF x oral absorption)/body weight (12.5 kg)

[1]RIVM (2006)
[2]Based on 75th percentile of amount orally ingested

Adults' exposure

Product type	Amount (mg/day)	C (%)	RF	Daily systemic exposure (mg/kg bw/day)
Toothpaste[1]	2780	0.052	0.058[3]	0.0014
Mouthwash[1]	40,000	0.009	0.10	0.0060
Dental floss[2]	36 (inch/day)	0.045 (mg/inch)	0.5	0.0135
Total				**0.0209**

C = concentration (%); RF = retention factor; assumed brushing and flossing twice daily and using mouthwash 4x/day
Daily systemic exposure = (Amount × C (%) × RF x oral absorption)/body weight (60 kg)

[1]RIVM (2006)
[2]Notifier exposure estimate
[3]Based on 75th percentile of amount orally ingested

6.2. Human Health Effects Assessment

The results from toxicological investigations conducted on the notified chemical are summarised in the following table. For details of the studies where full study reports were provided, refer to Appendix B.

Endpoint	*Result and Assessment Conclusion*
Rat, acute oral toxicity	LD50 = 500-1000 mg/kg bw; harmful
Rat, repeat dose oral toxicity – 14 week	NOEL = 5 mg/kg bw/day
Mutagenicity – bacterial reverse mutation	non mutagenic
Genotoxicity – in vitro mouse lymphoma assay	non genotoxic
Genotoxicity – in vitro unscheduled DNA synthesis assay	non genotoxic
Rat, reproductive and developmental toxicity	NOEL = 100 mg/kg bw/day

Toxicokinetics.
Based on the partition coefficient (log Pow = 2.23) and low molecular weight (< 500 Da) of the notified chemical passage across biological membranes may occur. This is supported by the evidence of toxicity in the acute and repeated oral toxicity studies. However, dermal absorption may be limited by the high water solubility (7 g/L).

Acute toxicity.
The notified chemical was found to be harmful in rats in an acute oral toxicity study.

No acute dermal toxicity data was provided. Dermal toxicity is not expected to be a concern given the low concentrations of the notified chemical in the finished products and expected short-time exposure to users.

No acute inhalation data was provided. The notified chemical is classified by the notifier as harmful by inhalation. However, given the low vapour pressure of the notified chemical, significant inhalation exposure is not expected.

Irritation and sensitisation.
No data were provided on the irritation potential. The notified chemical is classified as irritating to eyes on the MSDS provided by the notifier. The MSDS also states that the notified chemical is a mild skin irritant.

There was no data provided on the sensitisation potential of the notified chemical. However, while sensitisation cannot be ruled out, there are no structural alerts that would imply sensitisation potential and given its presence at very low concentrations in oral hygiene products, the notified chemical is not expected to present a sensitising hazard.

Repeated dose toxicity.
The notified chemical showed treatment-related hepatic and renal toxicity at doses of 10 mg/kg bw/day and higher in three studies including a 14-day study in groups of six rats of each sex, a 14-week study in groups of 30 rats of each sex and a 14-week study in groups of 30 rats of each sex (EFSA, 2011). In the last study, the NOEL was established as 5 mg/kg bw/day on the basis of histopathological lesions in the kidneys of male rats.

Mutagenicity/Genotoxicity.
The notified chemical was found to be non-mutagenic with or without metabolic activation in a standard Ames assay and non-mutagenic in an *in vitro* mouse lymphoma assay with L5178Y cells (EFSA, 2011). Unscheduled DNA synthesis was also not increased when WI-38 human cells were exposed to the notified chemical.

Toxicity for reproduction.
In a study of reproductive and teratogenic toxicity in rats, the notified chemical showed no reproductive effects or foetal abnormalities at doses up to 100 mg/kg bw/day (EFSA, 2011).

Health hazard classification
Based on the available information, the notified chemical is recommended for hazard classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia. The recommended hazard classification is presented in the following table.

Hazard classification	***Hazard statement***
Acute toxicity, oral (Category 4)	H302: Harmful if swallowed

Based on the available information, the notified chemical is recommended for hazard classification according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004), with the following risk phrase(s):

R22: Harmful if swallowed

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety
The notified chemical will be imported in finished products at low concentrations without a need for repackaging. Only transport and storage workers may come into contact with the notified chemical in the event of accidental rupture of packages. Therefore, the risk to the health of workers is not considered to be unreasonable.

6.3.2. Public Health
The notified chemical is proposed for use at up to 0.052% concentration in toothpastes, at 0.009% concentration in mouthwashes and at up to 0.045 mg/inch on dental floss. The notified chemical is harmful by the oral route and may be harmful if inhaled, irritating to the eyes and slightly irritating to the skin. However, the risk of acute toxic effects is not expected to occur at the proposed use concentrations.

The repeat dose toxicity potential was estimated by calculation of the margin of exposure (MoE) of the notified chemical using the worst case exposure scenario from use of multiple products for adults of 0.0209 mg/kg bw/day and toothpaste only for young children (2-4 year olds) of 0.444 mg/kg bw/day, and the NOEL of 5 mg/kg bw/day, which was established in a 14-week repeated dose toxicity study on the notified chemical. A MoE value $\geq$ 100 is considered acceptable to account for intra- and inter-species differences, and to account for long-term exposure. Using the abovementioned NOEL, a MoE of 239 for adults and 113 for young children was estimated, which are considered to be acceptable.

Based on the available information, the risk to the public associated with the notified chemical in the use of oral hygiene products (at up to 0.052% concentration in toothpastes, at 0.009% concentration in mouthwashes and at up to 0.045 mg/inch on dental floss) 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 as a component of toothpaste, mouth rinse and floss waxed coating. As manufacturing and reformulation will take place overseas, no release of the notified chemical is expected to occur in Australia from these activities. Any spills during transport are expected to be contained, collected and disposed of to landfill.

RELEASE OF CHEMICAL FROM USE

Toothpaste, mouth rinse and floss waxed coating containing the notified chemical will be sold nationwide. The majority of the notified chemical in toothpaste and mouthwash is expected to be used undiluted and will usually be released directly to the sewer. The notified chemical associated with the floss waxed coating is expected to be disposed of to landfill.

RELEASE OF CHEMICAL FROM DISPOSAL

Residues in empty product containers are expected to be disposed of to landfill.

7.1.2. Environmental Fate

The majority of the notified chemical is expected to be released to sewer during use. Due to its high water solubility and low n-octanol/water partition coefficient, the notified chemical is expected to remain in the aqueous phase. The notified chemical is not predicted to be readily biodegradable. Based on its low adsorption coefficient (log Koc = 1.67), only limited partitioning to sludge is expected. The notified chemical is not likely to bioaccumulate based on its high water solubility and low n-octanol/water partition coefficient (Pow). Some notified chemical is expected to be released to landfill due to disposal of spills and residues remaining in product containers. The notified chemical may leach from landfill and enter surface waters due to its high water solubility. In surface waters, the notified chemical is expected to disperse and eventually degrade through biotic and abiotic processes to form water and oxides of carbon and nitrogen.

A proportion of notified chemical may be applied to land when effluent is used for irrigation or when sewage sludge is used for soil remediation, or disposed of to landfill. Notified chemical residues in landfill, soil and sludge are expected to have a very high mobility based on its high water solubility and its predicted soil adsorption coefficient (log K_{oc} = 1.67).

7.1.3. Predicted Environmental Concentration (PEC)

Since most of the notified chemical will be washed into the sewer, under a worst case scenario, with no removal of the notified chemical in the sewage treatment plant, the resultant Predicted Environmental Concentration (PEC) in sewage effluent on a nationwide basis is estimated as follows:

Predicted Environmental Concentration (PEC) for the Aquatic Compartment		
Total Annual Import/Manufactured Volume	1,000	kg/year
Proportion expected to be released to sewer	100%	
Annual quantity of chemical released to sewer	1,000	kg/year
Days per year where release occurs	365	days/year
Daily chemical release:	2.74	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:	0.61	µg/L
PEC - Ocean:	0.06	µg/L

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 1500 kg/m^3). Using these assumptions, irrigation with a concentration of 0.606 µg/L may potentially result in a soil concentration of approximately 4.039 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 20.19 µg/kg and 40.39 µg/kg, respectively.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted. Ecotoxicological endpoints for the notified chemical were calculated using Ecological Structure-Activity Relationship (ECOSAR) v1.11 based on user entered Pow. Of these, the fish endpoint was deemed reliable for risk assessment purposes and is presented in the table below.

Endpoint	*Results*	*Assessment conclusion*
Acute toxicity		
Fish	LC50 (96 h) = 35 mg/L	Predicted to be harmful to fish

The ECOSAR estimation endpoint indicates that the notified chemical is harmful to aquatic organisms. As a validated reliable endpoint is available, the notified chemical is considered harmful to aquatic organisms on an acute basis, under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) (United Nations, 2009). Therefore, the notified chemical is formally classified as "Acute Category 3; Harmful to aquatic life" under the GHS.

7.2.1. Predicted No-Effect Concentration

The predicted no-effect concentration (PNEC) has been calculated from the predicted fish endpoint which was deemed reliable for the purpose of risk assessment (fish, 96 h LC50 = 35 mg/L) for the notified chemical. An assessment factor of 1000 has been used as acute toxicity endpoint for one trophic level was used

Predicted No-Effect Concentration (PNEC) for the Aquatic Compartment		
LC50 (Fish).	35	mg/L
Assessment Factor	1000	
PNEC:	35	µg/L

7.3. Environmental Risk Assessment

Risk Assessment	PEC µg/L	PNEC µg/L	Q
Q - River:	0.61	35	0.017
Q - Ocean:	0.06	35	0.0017

The Risk Quotients (Q = PEC/PNEC) for a worst case discharge scenario have been calculated to be < 1 for the river and ocean compartments. The notified chemical is not expected to be readily biodegradable or bioaccumulate in the environment. It is not likely to be present in ecotoxicologically significant concentrations in the aquatic environment. Therefore, the notified chemical is not expected to pose an unreasonable risk to the environment on the basis of the assessed use pattern.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Melting Point/Freezing Point 62.2 °C

Method OECD TG 102 Melting Point/Melting Range.
Remarks Determined by differential scanning calorimetry.
Test Facility SafePharm (2002a)

Boiling Point 251.8 °C at 101.7 kPa

Method OECD TG 103 Boiling Point.
Remarks Determined by differential scanning calorimetry.
Test Facility SafePharm (2002a)

Density 1,010 kg/m^3 at 21 ± 0.5 °C

Method OECD TG 109 Density of Liquids and Solids.
Remarks Determined using a gas comparison pycnometer.
Test Facility SafePharm (2002a)

Vapour Pressure 6.0×10^{-4} kPa at 25 °C

Method OECD TG 104 Vapour Pressure.
Remarks Determined using a vapour pressure balance system.
Test Facility SafePharm (2002b)

Water Solubility 7.0 g/L at 20 °C

Method OECD TG 105 Water Solubility.
Remarks Flask Method
Test Facility SafePharm (2002a)

Hydrolysis as a Function of pH

Method OECD TG 111 Hydrolysis as a Function of pH.

pH	*°C*	*t½*
4	25	> 1 year
7	25	> 1 year
9	25	> 1 year

Remarks Less than 10% hydrolysis after 5 days at 50°C, equivalent to a half-life greater than 1 year at 25°C.
Test Facility SafePharm (2002a)

Partition Coefficient (n-octanol/water) log Pow = 2.23

Method OECD TG 117 Partition Coefficient (n-octanol/water).
Remarks HPLC Method
Test Facility SafePharm (2002a)

Adsorption Coefficient log K_{oc} = 1.67

Method OECD TG 121 Adsorption Coefficient on soil and sewage sludge.
Remarks HPLC Method
Test Facility SafePharm (2002a)

Particle Size Mass Median Aerodynamic Diameter Not Determined

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

Range (μm)	*Mass (%)*
< 100 μm	21.7
< 10 μm	1.18

Remarks Determined using a 100 μm sieve in screening test and a Marple Miller Cascade Impactor in definitive test. Too few particles were of a size < 10 μm to allow accurate assessment of mass median aerodynamic diameter.

Test Facility SafePharm (2002a)

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/Sprague-Dawley CD
Vehicle — Arachis oil BP
Remarks - Method — A dose level of 2000 mg/kg bw was chosen as the starting dose in the absence of data suggesting the test substance was toxic.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw*	*Mortality*
2000	3 females	2000	2/3
300	3 females	300	0/3
300	3 females	300	0/3

LD50 — 500-1000 mg/kg bw (estimated)
Signs of Toxicity — Sings of systemic toxicity noted in animals at the dose level of 2000 mg/kg bw were hunched posture, loss of righting reflex, decreased respiratory rate, laboured respiration, increased salivation and occasional body tremors. Signs of systemic toxicity in animals at the dose level of 300 mg/kg bw were hunched posture, lethargy, ataxia, decreased respiratory rate, red/brown staining around the eyes, ptosis and occasional body tremors.
Effects in Organs — Abnormalities noted at necropsy of one animal treated with 2000 mg/kg bw that died during the study were dark liver and kidneys.
Remarks - Results — Two animals in the 2000 mg/kg bw group were found dead about 6 hours after dosing and the surviving animal recovered from systemic toxicity 3 days after dosing. No death was found in the 300 mg/kg bw group and the animals recovered from systemic toxicity 1-3 days after dosing. No abnormalities were noted at necropsy of all animals except one in the 2000 mg/kg bw group that died at the day of dosing.

CONCLUSION — The notified chemical is harmful via the oral route under the test conditions.

TEST FACILITY — SafePharm (2002c)

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