CORRIGENDUM – issued November 2015
Public report for LTD/1162

Page 13, In "Section 7.13T – Skin Sensitisation – Human Volunteers", make the following changes:

* Induction procedure – replace "9 volunteers" with "50(49) volunteers"
* Induction procedure – replace "of about 48 hours" by "at intervals of about 48 hours"
* Rest period – replace "15 weeks" by "15 days"
* Challenge procedure – replace "50 volunteers" with "50(49) volunteers"
* Challenge procedure – remove duplicated phrase "in each application"

File No LTD/1162

2 November 2004

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

CETEARYL GLUCOSIDE

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 and Heritage.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at:

Library
National Occupational Health and Safety Commission
25 Constitution Avenue
CANBERRA ACT 2600
AUSTRALIA

To arrange an appointment contact the Librarian on TEL + 61 2 6279 1161 or + 61 2 6279 1163.

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

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

CETEARYL GLUCOSIDE

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Orica Limited (ABN 24 004 145 868)
1 Nicholson street
Melbourne VIC 3000

Herbalife Australasia Pty Ltd (ABN 42 008 003 030)
123-125 Mooringe Avenue
Camden Park SA 5038

Trimex Pty Ltd (ABN 40 001 198 787)
5 Crewe Place
Rosebery NSW 2018

NOTIFICATION CATEGORY
Limited-small volume: Polymer with NAMW < 1000 (1 tonne or less per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication:

Composition of the notified chemical
Percentage of notified chemical in finished products
Names of finished products using the notified chemical

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed as follows:
Specific Gravity / Density
Vapour Pressure
Water Solubility
Hydrolysis as a Function of pH
Dissociation Constant
Particle Size
Flammability Limits
Auto ignition Temperature
Explosive Properties
Reactivity

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
None

2. IDENTITY OF CHEMICAL

CHEMICAL NAME
D-Glucopyranose, C16-18-alkyl glycosides

OTHER NAME(S)
Cetearyl Glucoside, D-Glucopyranoside, C16-18 straight chain monoalkyl-

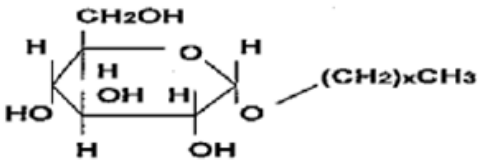
MARKETING NAME(S)
Cetearyl Glucoside, Montanov 68 (mixture of Cetearyl Glucoside and Cetearyl alcohol)

CAS NUMBER
246159-33-1

MOLECULAR FORMULA
Unspecified

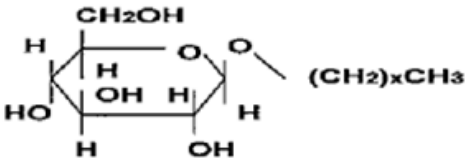
MOLECULAR WEIGHT
404-432

STRUCTURE



Where x= 15 and 17

C16-18 Alkyl alpha-D-Glucopyranoside



Where x= 15 and 17

C16-18 Alkyl beta-D-Glucopyranoside

SPECTRAL DATA

METHOD IR film between NaCl plates range 4000 cm^{-1} to 600 cm^{-1}
Remarks The IR Spectrum provided is for Montanov 68 with major peaks at 720, 1040,1060 1150,1380,1460, 2850, 2930 and 3400 cm^{-1}.

3. COMPOSITION

DEGREE OF PURITY
100%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS
NONE

ADDITIVES/ADJUVANTS
Cetearyl alcohol

4. 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 mixture with cetearyl alcohol (Montanov 68) for use as a cosmetic raw material by Orica Limited and as a component of a cosmetic cream or lotion by Trimex Pty Ltd and Herbalife Australasia Pty Ltd. The notified chemical will not be manufactured in Australia.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	0.975	0.975	0.975	0.975	0.975

USE
The notified chemical will be used as an emulsifier in cosmetics. It maintains skin moisture and results

in smooth thick creamy cosmetic creams and lotion products.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, transport and storage

PORT OF ENTRY
The notified chemical will initially be imported in finished products and as the commercial product, Montanov 68 through Sydney and Melbourne.

IDENTITY OF MANUFACTURER/RECIPIENTS
Orica Limited will be importing the commercial product Montanov 68 to sell to cosmetic manufacturers. Trimex Pty Ltd and Herbalife Australasia Pty Ltd will import finished cosmetic products.

TRANSPORTATION AND PACKAGING
The notified chemical will be imported as a commercial raw material, Montanov 68, in 20 kg drums on pallets inside containers and will travel from the wharf by road transport to the Orica Limited, Warehouse and Distribution Centre, 215 Dohertys Rd, Laverton, North Victoria 3026. It will be transported to cosmetic manufacturers by road transport.

The notified chemical will also be imported as finished products in small jars and bottles up to 200 mL suitable for retail sale. These bottles will be packed in cardboard cartons and packed 12 cartons to a cardboard shipper. The shippers will be transported in a container from the wharf, to various companies' sites. The cartons will be transported to the retail store's central distribution centres by road transport.

STORAGE FACILITIES & STORAGE REQUIREMENTS
The drums and cartons on pallets will be stored in a racked warehouse. The warehouse is fully bunded so that any spills can be directed to waste water pits on each site. The raw material is not flammable or explosive and will not self ignite. No national or industry codes of practice or guidance notes or Australian Standards are applicable to the storage of this raw material.

5.2. Operation description

The notified chemical will be imported into Australia either as a component of formulated products or raw material for subsequent formulation into products. During reformulation into cosmetic products, the notified chemical will be added manually into a mixing tank. The blend will be heat mixed and the resulting mixture will be fed through an enclosed system to an automatic packaging machine, where the product is fed into plastic bottles.

The bottled products will be packed in cardboard cartons and will be sent to retail distribution centres for storage until distribution to retail outlets.

5.3. Occupational exposure

Number and Category of Workers

Category of Worker	*Number*	*Exposure Duration*	*Exposure Frequency*
Transport and Storage	10	4	12
Professional compounder	1	8	12
Chemist	1	3	12
Packers (Dispensing and Capping)	2	8	12
Store Persons	2	4	12

Exposure Details
Approximately 10 dockside and warehouse workers per shipment will be involved in transporting the finished products from the wharf to the Company sites and placing the pallets of product into their warehouses. Dockside and warehouse workers may handle monthly shipments for 4 hours per day.

A further two warehouse workers in the notifier's warehouse will be involved in transferring pallets

from the warehouse to the retailer's central distribution depots.

Dockside and warehouse workers routinely wear uniforms and safety shoes. They are not expected to have any contact with the notified chemical, except in the case of spills.

If at some time in the future when local manufacture became viable then local production as described below may apply.

A compounder will weigh an appropriate amount of the commercial ingredient into a separate container then add the amount directly into the mixing tank. In the mixing vessel heating will be required to melt the commercial raw material. During the process, the compounder may be exposed incidentally to drips, spills and vapours, possibly through inhalation, ocular and dermal. The inhalation exposure for a compounder is not known but expected to be low as the commercial raw material is a solid melting at 61-65^{o}C.

The compounder is to wear safety glasses with shields, gloves, apron or coverall, however respiratory protection is not required in a site such as a TGA GMP approved site, as there would be plenty of ventilation.

The Chemist would sample and test the ingredient for QA purposes, wearing protection for eyes, and skin, body and hands. A sample would be taken using a dip tube (large pipette).

Packers would monitor the line filler and the capper where the finished product was filled into retail bottles. They would wear safety glasses and gloves for skin, body and hands protection.

Store Persons would remove the pallets of finished product from the end of the packing line and store the finished product in the finished store. They would also receive the ingredient when first delivered and store it in the raw material store. Quantities of the ingredient would be issued to the Compounder for production as required.

Compounder, Packers, Chemists and Store Persons would be involved monthly in production of finished product.

Training will be in line with Good Manufacturing Practices (GMP). Workers who have undergone education or training programmes for handling of chemicals will not require additional training. Copies of MSDS for all chemicals will be available at a number of sites including in a folder at the compounder's workstation along with a copy of the batch sheet for the finished product.

5.4. Release

RELEASE OF CHEMICAL AT SITE

Release to the environment may be considered at several stages:

Transport of the chemical prior to formulation: This is not likely to constitute a major pathway, as the material is likely to be containerised, or in packaging designed to withstand impact. Accidental spills during transportation should be relatively easily recovered and disposed.

Storage and product formulation: With the relatively low level use proposed for this product, with its formulation and dispensing in closed systems, it is unlikely that there will be any significant release to the environment. Accidental releases during product formulation are unlikely to present a major hazard.

In a formulated product the process is a batch process with a batch typically 6 tonne with each batch containing 75 kg of the notified chemical being produced in 4 hours, 13 batches per year. Emissions to waste water are possible while cleaning the equipment. It is estimated that 2-3% final product are rinsed into the waste water collection which then goes to a biological treatment plant. The content of emitted (E) is 975 kg x 3%/ 365 = 0.08 kg per day over a period of 1 year (approximately 30 kg/year).

RELEASE OF CHEMICAL FROM USE

Given the use pattern of the notified chemical, initial release is entirely expected to occur to the

aquatic compartment. Assuming the maximum importation volume of 975 kg of notified chemical and use of the notified chemical occurring all year, the average daily release is expected to be 2.67 kg.

While direct release is likely to be to the aquatic compartment, it is difficult to consider which environmental medium the chemical will finally reside in without considering the fate of the substance. The nature of emulsifiers indicates they could associate with sludge due to hydrophobic moieties or remain in solution due to hydrophilic moieties. This is despite the high estimates for adsorption/desorption and partition coefficient. Consequently, once in the sewage treatment plant, the chemical may end up in receiving waters or associated with sludge where it could be incinerated, or in some cases, applied to agricultural land. In the case of the notified chemical and its insolubility in water, it is likely that it will temporarily reside in the sludge as it is readily biodegradable.

The total amount of notified chemical being used in Australian cosmetic products at any one time is likely to be small, as the chemical will be only applied in a limited range of consumer products. It is anticipated that the chemical will be incorporated at <2% concentration in a finished product with pack sizes up to 200 mL. Most use will take place in bathrooms or similar 'wet' areas which normally drain to sewage. The final product will have a wide dispersive use and the fraction released to the environment can be expected to be 100 %.

5.5. Disposal

Waste and expired material will be disposed of according to Federal, State and Local regulations. If a spill occurs the spill is to be shovelled up or absorbed with sand or other absorbent and the area washed with water. Solutions are neutral pH. The chemical is biodegradable. It is to be disposed of to approved landfills. If the product is burnt the combustion products will be carbon oxides and nitrogen oxides.

5.6. Public exposure

The notified chemical as its commercial product Montanov 68, containing 25% (range 10-40%) of the notified chemical, will not be sold to the general public. The notified chemical will be sold in finished products to the general public for cosmetic use.

Public exposure to the notified chemical (in products) as a result of transportation within Australia is unlikely unless there is an accident. The material safety data sheets (MSDS) supplied for the commercial product have instructions for clean-up and disposal of any accidental spills and therefore public exposure as a result of a transport accident is likely to be negligible.

If the notified chemical is blended in Australia to produce the finished cosmetic creams or lotions, then direct public exposure as a result of blending to the notified chemical is considered to be negligible since adequate engineering controls and standard operating procedures largely prevent any significant release of the notified chemical into the immediate vicinity of the site of blending.

Since the finished products will be sold to the general public, widespread public exposure is expected. Members of the public are likely to make dermal and possibly ocular contact with the notified chemical as a result of use of the product at a concentration of <2%.

Since the finished products will be stored and used in a domestic environment, there is the possibility of accidental ingestion by a child.

6. PHYSICAL AND CHEMICAL PROPERTIES

Unless otherwise stated, the physicochemical properties below are for the product (Montanov 68) containing the notified chemical at 10-40%.

Appearance at 20°C and 101.3 kPa White flakes

Melting Point/Freezing Point 61-65°C

METHOD	SEPPIC Method S52009B
Remarks	No test report provided
TEST FACILITY	SEPPIC (2001)

Density Not determined

METHOD
Remarks Not applicable. Montanov 68 is a flaked solid
TEST FACILITY

Vapour Pressure Not determined

METHOD
Remarks The notified chemical has a high molecular weight of 404-432 and will have a low vapour pressure estimated at $<10^{-5}$ kPa. The vapour pressure for cetyl alcohol, the lowest molecular weight component, is $<10^{-5}$ kPa.
TEST FACILITY

Water Solubility >10 g/L at 20ºC (estimate)

METHOD
Remarks Not determined. Forms an emulsion in water up to at least 10%. Based on the estimates for partition coefficient and adsorption/desorption, true solubility is likely to be much lower.
TEST FACILITY

Hydrolysis as a Function of pH Not determined

METHOD
Remarks This test has not be carried out as Montanov 68 the commercial mixture of the notified chemical is supplied and recommended for and has been sold overseas for at least 2 years for use in the pH range of 3-9.
The notified chemical is stable over a wide pH range due to its ether linkage and its non ionic nature. Under extreme pH and temperature, the notified chemical hydrolyses to C16-C18 fatty alcohols and glucose.
TEST FACILITY

Partition Coefficient (n-octanol/water) log Pow = 5.71 (Calculated estimate for notified chemical)

METHOD
Remarks The notified chemical is an emulsifier and therefore it was not possible to accurately measure the n-octanol-water partition coefficient. An estimated value has been determined from the contributions to Log Kow from the individual components using a fragmentation procedure.
TEST FACILITY SEPPIC (2004)

Adsorption/Desorption – screening test log K_{oc} =4.48 (calculated estimate for notified chemical)

METHOD Log Koc Calculation (QSAR.).
REMARKS The notified chemical is an emulsifier and therefore it was not possible to accurately measure adsorption/desorption. An estimated value has been determined from the Log Koc Lyman equation of Log Koc = 0.544*LogKow + 1.377.
TEST FACILITY SEPPIC (2004)

Dissociation Constant Not applicable

METHOD
Remarks The test was not conducted as the notified chemical is a non-ionic surfactant which has no groups which will dissociate.
TEST FACILITY

Particle Size Not applicable

METHOD
Remarks The test is not relevant as the notified chemical is a solid in flaked form
TEST FACILITY

Flash Point >100ºC at 101.3 kPa

METHOD AFNOR Method No NFT60103
Remarks No test report provided.
TEST FACILITY

Flammability Limits Not determined

METHOD
Remarks The test was not conducted as the notified chemical has a high molecular weight and projected to have a low vapour pressure
TEST FACILITY

Autoignition Temperature Not determined

METHOD
Remarks The test was not conducted as the notified chemical is not expected to auto ignite.
TEST FACILITY

Explosive Properties Not determined

METHOD
Remarks The test was not conducted as the notified chemical does not possess a chemical structure expected to be explosive.
TEST FACILITY

Reactivity Not reactive

Remarks Montanov 68 is stable under normal environmental conditions. Montanov 68 is compatible with other cosmetic substances under normal usage conditions. Montanov 68 is stable between pH = 3 and pH = 9. In extreme conditions (extreme pH and temperature), Montanov 68 hydrolyses to fatty alcohols and glucose.

PH 5.5-7.5 at 20ºC

METHOD AFNOR Method NFT 73 206
Remarks pH is determined as 5% emulsion of Montanov 68 in water.
TEST FACILITY SEPPIC (2001)

7. TOXICOLOGICAL INVESTIGATIONS

Endpoint and Result	*Assessment Conclusion*
Irritation- Eye - Hen's Egg Test Chorio-Allantoic Membrane	non-irritating
Guinea pig, skin sensitisation – adjuvant test.	no evidence of sensitisation.
Genotoxicity – bacterial reverse mutation	Non mutagenic
Skin sensitisation- Human volunteers- Marzulli and Maibach repeat patch test	Non irritant and non sensitising
Skin Irritation- human volunteers- patch test	Non to low irritancy
Test for comedogenous potential- human volunteers	Not comedogenous
In addition an oral LD_{50}(rat) of >2000 mg/kg was quoted on the MSDS for Montanov 68.	

7.5. Irritation – eye

TEST SUBSTANCE: Montanov 68 in water (1.25% notified chemical).

METHOD: **HET-CAM (Hen's Egg Test Chorio-Allantoic Membrane)**
The tested compound is applied to the chorioallantoic membrane of embryonated hen's egg. In this test the highly vascularized chorioallantoic membrane mimics the cornea. Severely irritant compounds induce hyperemia, hemorrhage and protein coagulation on the membrane surface.

This assay is intended to determine the ocular irritancy potential of chemicals and formulations.

Fresh, intact White Leghorn hen fertilized eggs of about 60g, are incubated at 37.5° C for 10 days, with the large end up. Eggs are automatically rotated every hour.

0.3mL of the prepared sample was spread over the chorio-allantoic membrane using a 1 mL pipette. The stop watch was started when the product was applied. Rinsing with 5mL of demineralised water was carried out 20 seconds later.

Hyperaemia, haemorrhage and coagulation are scored against a scale of irritant effects 0.5, 2 and 5 minutes after treatment to maximums or 5, 7 and 9 respectively. The numerical scores are summed to give a single numerical value .for 4 or 6 eggs treated with each compound or concentration. The mean score value allows the irritant potential to be assigned to one of 5 classes (non irritant, slightly irritant, moderately irritant, irritant and severely irritant).

RESULTS

End point	Effect	Result	Score	Class
Hyperaemia	Vasodilation observed from the appearance of new capillaries or the dilation of capillaries that are already visible.	No Hyperaemia	0	Non-irritant
Haemorrhage	Effusion of blood outside of vessels and capillaries	No Haemorrhage	0	Non-irritant
Coagulation	Membrane opacity or thrombosis	No Coagulation	0	Non-irritant

CONCLUSION: Diluted Montanov 68 is determined to be non irritant under the conditions of the test.

TEST FACILITY: SEPPIC (2000)

7.6. Skin sensitisation

TEST SUBSTANCE: Montanov 68 in physiological saline solution.

METHOD: OECD TG 406 Skin Sensitisation - Magnusson and Kligman method.

Species/Strain: Guinea pig/Dunkin Hartley
PRELIMINARY STUDY: Maximum Non-irritating Concentration:
intradermal:
topical: 10% test substance
MAIN STUDY
Number of Animals: Test Group: 5M, 6F Control Group: 3M, 2F

INDUCTION PHASE	Induction Concentration: intradermal: 10% in physiological saline Topical: 10% in saline
Signs of Irritation	No sign of irritation noted in test animals
CHALLENGE PHASE	
1st challenge	topical: 5% and 10% in physiological saline
Remarks - Method	No significant protocol deviations

RESULTS

Animal	*Challenge Concentration*	*Number of Animals Showing Skin Reactions after: 1st challenge*	
		24 h	*48 h*
Test Group	10%	2/11	0/11
	5%	2/11	0/11
Control Group	10%	2/5	0/5
	5%	1/5	0

Remarks - Results	No macroscopic cutaneous reactions attributable to allergy were recorded during the examination following the removal of the occlusive dressing (challenge phase) from the animals of the treated group with the test product. No cutaneous intolerance reaction was recorded in animals from the negative control group.
CONCLUSION	There was no evidence of reactions indicative of skin sensitisation to the notified chemical under the conditions of the test.
TEST FACILITY	Phycher Bio Development (2004)

7.8. Genotoxicity – bacteria

TEST SUBSTANCE	Montanov 68 in water (1.25% notified chemical).
METHOD	OECD TG 471 Bacterial Reverse Mutation Test. Plate incorporation procedure
Species/Strain	*S. typhimurium*: TA1538, TA1535, TA1537, TA98, TA100.
Metabolic Activation System	S9 Mix
Concentration Range in Main Test	a) With metabolic activation: 0-5000 µg/plate. b) Without metabolic activation: 0-5000 µg/plate.
Vehicle	Absolute alcohol
Remarks - Method	Only 50 uL of the test article solution was administered instead of 100uL as previous in the protocol in relation with ethanol toxicity vis a vis the bacterial strains. This deviation was not considered to have affected the outcome or the objectives of the study.

RESULTS

Remarks - Results	Under the experimental conditions employed no value obtained in the presence of the test article was greater than or equal to twice the value obtained in the presence of vehicle with and without metabolic activation on the bacterial strains used.
CONCLUSION	The notified chemical was not mutagenic to bacteria under the conditions of the test.

TEST FACILITY Hazleton France (1991)

7.13T. Skin sensitisation – human volunteers

TEST SUBSTANCE Montanov 68 5% in physiological saline solution.

METHOD Repeated insult patch test. Marzulli and Maibach's method

Study Design	The study consisted of an induction procedure and a challenge procedure.
Study Group	36 (or 35) females and 14 males aged from 19 to 59 years old
Vehicle	5% Montanov 68 in distilled water
Induction Procedure:	The test substance was applied to 9 volunteers in 9 consecutive applications of about 48 hours or for the first two weekends 72 hours. In each application about 0.02ml was applied to the same area by the occlusive epicutaneous route to the skin of the arm.
Rest Period:	15 weeks
Challenge Procedure:	The test substance was applied to 50 volunteers in a single application for about 48 hours. In each application. In each application about 0.02ml was applied to the back by the occlusive epicutaneous route.
Remarks - Method	In the preliminary study only a hardly visible erythema was detected in 2 out of the 9 volunteers examined without any clear dose level/ effect relation. In the main study neither pathological irritation, nor sensitisation reaction significant of a cutaneous intolerance was noted.

RESULTS

Remarks - Results	The Mean Irritation Index (MII) obtained during induction was equal to 0.03, thus allowing arbitrary classification of the test article as "non irritant"

CONCLUSION Montanov 68 diluted with distilled water to 5% was non-irritating and non-sensitising under the conditions of the test.

TEST FACILITY Institut D'Expertise Clinique (1994)

7.21T. Skin Irritation- Human Volunteers

TEST SUBSTANCE Montanov 68 at five concentrations of 0.5%, 1.1%, 2.2%, 4.7% and 10% dilution in distilled water.

METHOD A patch test of 24 hours with scoring 30 minutes after the patch was removed.

Study Design	The study consisted of two aluminium cups taped to the skin with each cup having filter paper with test product under it. The cups were 8mm in diameter, 50 mm^2 in area and had a capacity of 20 uL. Different concentrations of test product are on the two filter papers. The cups were fixed to the upper left hand corner of the back. A control set of two cups one without product and the other with reference product of 0.5% sodium lauryl sulfate in distilled water were applied to a different part the back
Study Group	8 females and 2 males aged from 17 to 44 years old
Remarks – Method	The test is small in numbers and should be regarded as supplementary to other data presented with more recent and more widely used protocols

RESULTS

Remarks – Results

	SLS	Montanov 68				
	0.5%	0.5%	1.1%	2.2%	4.7%	10%
No Reaction	2	10	9	9	8	8
Slight Erythema	8	0	0	0	1	2
Erythema	0	0	1	1	1	0

The reactions observed for concentrations greater than or equal to 1.1%

may be considered as similar and in all cases lower than that observed with sodium lauryl sulfate.

CONCLUSION Montanov 68 diluted with distilled water to 10% did not induce any significant irritation of the skin in most of the subjects and the tolerance of the product may be considered satisfactory.

TEST FACILITY Biogir S.A Conseil Recherche (1990)

7.22T. Comedogenous potential- Human Volunteers

TEST SUBSTANCE Montanov 68 at 10% dilution in distilled water.

METHOD The product, 10% Montanov 68 in water was applied to faces of 10 female volunteers for 28 days.

Study Design The study consisted of 10 female volunteers selected with a family history of acne and having oily skins. For 28 days the volunteers applied the product twice a day onto the face.

Photographs of face before the test and after test were taken.

Study Group 10 females aged from 18 to 40 years old

Remarks – Method The test is small in numbers and should be regarded as supplementary to other data presented with more recent and more widely used protocols

RESULTS

Remarks – Results No acneform lesions occurred which can be attributed to the tested chemical. Sensation of discomfort (red blotches, smarting or pulling) was experienced by three volunteers, however, these disappeared during the course of test.

CONCLUSION Montanov 68 diluted with distilled water to 10% was non-comedogenous in most of the subjects.

TEST FACILITY Evic Ceba (1992)

8. ENVIRONMENT

8.1. Environmental fate

8.1.1. Ready biodegradability

TEST SUBSTANCE Montanov 86 (mixture with cetearyl alcohol)

METHOD EEC: 84/449- Annex V Method C5 (1984) Adapted- Modified Sturm Test (OEDC TG 301 B)

Inoculum Activated sludge from a municipal sewage treatment plant receiving little or no industrial effluent

Exposure Period 28 days

Auxiliary Solvent

Analytical Monitoring Determination of CO_2 production by back titration with Barium Hydroxide

Remarks – Method Study concentration of test substance (Montanov 68) 20mg/L and reference substance sodium acetate 20 mg/L. Temperature range: 22.5-23.5˚C. pH range 8.52-7.93.

RESULTS

Test substance- Montanov 68		Reference Substance- Sodium acetate	
Day	*% degradation*	*Day*	*% degradation*
4	30	4	3
10	78	10	12
28	97	28	84

Remarks – Results

The notified chemical showed a biodegradability of 97% in 28 days under the conditions of a Modified Sturm test, which was reached by day 15. The test was validated, as the reference substance (sodium acetate) showed a biodegradability of >84% for the 28 day study period.

This is in line literature results (Madsen et. al. 2000) for similar alkyl glycosides with APG (alkyl pendant group) of C8-16, having biodegradability of 100% (Modified OECD screening test, 28 d) and 80% (Closed bottle test, 30 d) and with APG of C12-16 having biodegradability's of 100% (Modified OECD screening test, 28 d) and 78% (Closed bottle test, 30 d).

CONCLUSION The notified chemical can be classed as ready biodegradable.

TEST FACILITY Societe d'Elevage- Piscicole Controle (1991)

8.2 Ecotoxicity Data

No ecotoxicological data is available for the notified chemical, however the following literature data (Madsen et al. 2000) are available for toxicity of other alkyl glycosides towards fish, daphnia and algae:

The reported effect of Alkyl glycosides with APGs of C8-16 towards Zebra fish is 96 h LC50 = 7.8 mg/L.

The reported effects of Alkyl glycosides with APGs of C8-16 towards *Daphnia magna* are 48 h EC50 = 20 mg/L and 85 mg/L respectively.

The reported effects of Alkyl glycosides with APGs of C8-16 towards algae are 96 h EC50 = 14.8 mg/L and NOEC = 5.0 mg/L.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

The notified chemical will be imported into Australia either as a component of formulated product or raw material for subsequent formulation into products. The majority of the imported polymer would eventually be discharged into sewerage systems through washing. Release of approximately up to 30 kg per annum is expected during the reformulation process and as residues in import and consumer containers. Most of this will be disposed of in landfill with a very small amount may be accidentally released to the sewer at the reformulation sites.

The notified chemical forms an emulsion at least up to 10% thus it may be relatively mobile in both the aquatic and terrestrial compartments. However, the estimated Koc and Kow are high. The notified chemical is readily biodegradable, therefore, it is likely to be gradually degraded to natural components. Residual chemical disposed of to landfill with empty containers can also be expected to be adsorbed to soil particles and will degrade through biological and abiotic processes. The high molecular weight of the notified polymer will limit bioaccumulation.

Given the use pattern of the notified chemical, initial release is entirely expected to occur to the aquatic compartment. Assuming the maximum importation volume of < 1 tonne of notified chemical and use of the notified chemical occurring all year, the average daily release is expected to be 2.67 kg. This release is expected to be relatively diffuse. The predicted environmental concentration (PEC) in the aquatic environment is estimated using the following worst-case scenario.

Assuming that the majority of the imported polymer is eventually released to sewer and not removed during sewage treatment processes, the daily release on a nationwide basis to receiving waters is estimated to be 2.67 kg/day, based on a maximum import of 1 tonne per annum. Based on a national population of 20 million and that each person contributes an average 200 L/day to overall sewage flows, the PEC in sewage effluent on a nationwide basis is estimated as 0.685 µg/L. Based on dilution factors of 1 and 10 for inland and ocean discharges of STP treated effluents, the PECs of the notified polymer in freshwater and marine water may approximate 0.685 µg/L or 0.0685 µg/L, respectively.

9.1.2. Environment – effects assessment

While no data were provided on environment effects, the use and properties of the notified chemical indicate high exposure to the aquatic environment. Therefore the absolute predicted no effects concentration (PNEC) cannot be derived, however, based on literature data (Madsen et al. 2000), an estimate for the PNEC may be obtained.

Using the lowest LC50 for zebra fish and assuming a safety factor of 1000, as this is surrogate data for which reports are available, the predicted no effect concentration (PNEC) is 7.8 µg/L.

9.1.3. Environment – risk characterisation

The notified chemical will be used as an ingredient of personal care formulations, and almost all will eventually be released into domestic sewage systems as a consequence of product use. It is expected that most of the material would eventually partition to sediment and slowly degrade to water and oxides of carbon through biological processes.

Assuming a worst-case situation where the entire import volume of 1000 kg is released to sewer and remains in the aqueous compartment, the PEC would be expected to be low (0.685 µg/L for freshwater) for the aquatic environment, assuming nationwide use. The PEC/PNEC ratios (PNEC obtained from literature data on similar alkyl glycosides) are 0.087 and 0.009 for release to freshwater and marine waters respectively. Based on these figures, the risk quotients indicate low risk to aquatic organisms, as long as import volumes do not rise significantly above 1000 kg per annum.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Exposure to the notified polymer is expected to primarily occur during reformulation of cosmetic products, especially when manually adding the notified chemical into the mixer where the final products are produced. Subsequent operations such as mixing and packaging are enclosed and automated and involve the notified chemical at much lower concentrations, and therefore, exposure to the notified chemical is expected to be reduced. During formulation and packaging, workers are clad with chemical goggles, appropriate gloves and aprons to prevent dermal and ocular exposure to the notified polymer and the products containing it. Local exhaust ventilation is in place to capture any volatiles during the formulation process.

Dermal contact with the formulated product is also possible during equipment cleaning and routine maintenance. However, such exposures are expected to be low since the final products will contain low levels of the notified chemical (<2%). The dermal exposure will be incidental (gloves are normally worn) and is calculated to be 0-0.1mg/cm^2/day. Both hands can be exposed which corresponds to an exposed dermal area of 840cm^2. The assessed dermal exposure is 0-84 mg/day or 0-1.2mg/day/kg bw for a 70 kg worker.

The imported finished product contains the notified chemical at a maximum level of <2% (5%

addition of 25% blend) and if the product is made locally then the notified chemical is present in an aqueous solution at 25% (range 10 to 40%). Inhalation exposure of the notified chemical during blending with heating is not expected as the blending process is automated and occurs in a closed vessel.

Exposure to waterside, warehouse and transport workers is low considering the handling of sealed packages of the notified chemical and products containing it. Distribution, warehouse and retail workers will have negligible exposure as these workers will only handle sealed containers of finished products.

Since the chemical will be handled, mixed and dispersed in closed systems and at low usage rates, indirect exposure is likely to be very low or non-existent under normal working conditions.

9.2.2. Public health – exposure assessment

There will be significant public exposure to the notified chemical as it will be used in personal care products. Dermal and possibly eye exposure to the notified polymer can occur when used in a personal care product. There is also a slight chance of ingestion of the notified chemical although the quantities consumed would be minimal. The concentration of the notified chemical in finished products would be <2%.

The content of the notified chemical is <2%. Consumers will use a finished product such as a skin cream, containing the chemical once a day. It is assumed that 2 g (0.024g of chemical) per application is used.
The assessed dermal exposure is:

$$Eder = \frac{W \times Tder \times C \times n}{100 \times 100 \times BW}$$

W	= Weight of product used per event	=	2000mg
Tder	= Weight fraction of notified chemical	=	<2%
C	= Fraction remaining on skin after use	=	100%
n	= Frequency of use	=	1 x per day
BW	= Body Weight	=	55 kg

$$Eder = \frac{2000 \times <2 \times 100 \times 1}{100 \times 100 \times 55} = 0.45 \text{ mg/ kg of body weight.}$$

The notified chemical may be released into the environment as a result of disposal of waste from blending (if this is done in Australia at some time in the future), accidental spills during transport or disposal of diluted products and containers after use. The environmental releases are expected to be relatively small and most of the notified chemical released into the environment is expected to enter sewers where large dilutions are expected. Therefore, indirect public exposure via the environment is expected to be very low.

9.2.3. Human health – effects assessment

Toxicological testing of the notified chemical was conducted for a dilute (1.25%) in water. At this concentration the notified chemical was not irritating to eye and non mutagenic to bacteria.

At 10% concentration in saline solution it was not a skin sensitizer in guinea pig adjuvant test.

Repeated insult path testing of human volunteers at 5% saline solution shows no irritation or sensitisation under the conditions of test. Patch testing of the notified chemical on human volunteers up to 10% concentration did not induce any significant skin irritation. The notified chemical was not determined to be comedogenous to human volunteers at 10% concentration in water.

Based on the toxicological studies provided, the notified chemical is expected to have low acute and subchronic toxicity. It is not irritating to eyes or skin, or sensitising to skin. A bacterial mutation assay suggests that the notified polymer is not mutagenic. However, studies were only available for dilute solutions of the notified chemical. No epidemiological studies on workers

who have been exposed to the chemical have been carried out.

Based on the available data, the notified chemical is not classified as a hazardous substance in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC 2002).

9.2.4. Occupational health and safety – risk characterisation

The notified chemical will be imported as a component of finished cosmetic products at <2% concentration and as raw material at <40% concentration in cetearyl alcohol. The majority of formulation process is enclosed and automated. However, addition of the notified chemical to the mixer involves manual operations. Exposure is limited to dermal and to a lesser extent ocular when manually adding the notified chemical into the mixer. Inhalation exposure during normal handling and use is unlikely due to PPE and ventilation.

Overall, the risk of adverse health effects arising from exposure to the notified chemical is low due to its low toxicity and enclosed automated operations in the formulation and packaging of personal care products. The health risk for workers handling the packaged finished products during distribution and retailing will be negligible.

The potential for exposure during storage and transport would also be considered low and would only be envisaged following accidental spillage or damage of the containers. Therefore, the health risk for transport workers would also be assessed as low.

9.2.5. Public health – risk characterisation

Members of the public may apply cosmetic products containing the notified chemical on daily basis. The estimated public exposure (0.45 mg/kg/day) as a worst-case scenario is considered to be low. In addition, the notified chemical is of low toxicity. Thus, the health risk for public members using cosmetic products containing the notified chemical is expected to be low.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.1. Hazard classification

Based on the available data the notified chemical is not classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substances*.

and

It was not possible to classify the notified chemical using the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS) (United Nations, 2003). This system is not mandated in Australia and carries no legal status but is presented for information purposes.

10.2. Environmental risk assessment

On the basis of the widespread and low use level and import volume, the notified chemical is not considered to pose a risk to the environment.

10.3. Human health risk assessment

10.3.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

10.3.2. Public health

There is Negligible Concern to public health when used as described.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of the products containing the notified chemical provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC 2003). They are published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for the notified chemical and products containing the notified chemical) provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC 1994). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

REGULATORY CONTROLS

CONTROL MEASURES

Occupational Health and Safety

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical during formulation:
  - Safety glasses
  - Gloves
  - Aprons

  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 NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Environment

Disposal

- The notified chemical should be disposed of by recovering the product if possible and disposing to landfill.

Emergency procedures

- Spills/release of the notified chemical should be prevented from spreading or entering into drains, ditches or rivers by using sand, earth or other appropriate barriers. Small spills may be diluted with water, whilst larger spills should be adsorbed with inert material (sand or vermiculate) and disposed of in accordance with local, state and federal authorities.

12.1. Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

(1) Under subsection 64(1) of the Act; if
  - the importation volume exceeds one tonne per annum notified chemical;

or

(2) Under subsection 64(2) of the Act:

- if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required. Should imports rise above 1 tonne/annum, toxicity data to fish, daphnia and algae should be provided to confirm the above conclusions based on surrogate data.

No additional secondary notification conditions are stipulated.

13. BIBLIOGRAPHY

Biogir S.A. (1990) Assessment of Primary Cutaneous Tolerance in 10 Healthy Volunteers, Paris France. (unpublished report provided by Notifier) July 2000.

Evic-Ceba (1992) Clinical Assessment of the Comedogenous Power of emulsion Montanov 68, France (unpublished report provided by Notifier) 30 April 1992.

Hazleton France (1991) Salmonella Typhimurium/ Mammalian Microsome Plate Incorporation Assay (Ames Test, Paris France (unpublished report provided by Notifier) 28 October 1991.

Insitut d'Expertise Clinique (1994) Evaluation of the Irritating and Sensitising Potentials of a Raw Material (Marzulli and Maibach's Method, Lyon France (unpublished report provided by Notifier) 25 November 1994.

Madsen T, Boyd HB, Nylen D, Pedersen, AR, Petersen GI and Simonsen F (2000) Environmental and health assessment of substances in household detergents and cosmetic detergent products. Environmental Project No. 615 2001, Centre for Integrated Environment and Toxicology, Horsholm, Denmark.

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 (2002) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(2002)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

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

Phycher Bio Development (2004) Assessment of sensitising Properties on Albino Guinea Pig, Castres France (unpublished report provided by Notifier) 16 January 2004.

Societe d'Elevage Piscicole Controle (1991) Test to Evaluate Biotic Degradation- Modified Sturm Test, Pontcharra-sur-turdine France (unpublished report provided by Notifier) 1 August 1991

SEPPIC (2000) Tolerance According to HET-CAM Test on the Chorio-allantoic membrane of a hen's egg, Paris France (unpublished report provided by Notifier) 4 October 2000.

SEPPIC (2001): Montanov 68- Certificate of Analysis, (unpublished report provided by Notifier) 30 August 2001.

SEPPIC (2004) Cetearyl Glucoside C16 and C18 Monoglucosides- N-Octanol/water partition coefficients and Adsorption/ Desorption Coefficients. Paris France (Unpublished report provided by Notifier) 1 June 2004

United Nations (2003) Globally Harmonized System of Classification and Labelling of Chemicals (GHS) 2003 ST/SG/AC.10/30 New York.