File No: NA/132

Date: 8 November, 1993

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

D-GLUCITOL, BIS-O-[(4-METHYLPHENYL)METHYLENE]-

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

D-GLUCITOL, BIS-O-[(4-METHYLPHENYL)METHYLENE]-

1. APPLICANT(S)

Robert Bryce & Co. Limited, 145/147 Glenlyon Road, Brunswick, Victoria 3056

2. IDENTITY OF THE CHEMICAL

Chemical name: D-Glucitol, Bis-o-[(4-methylphenyl)methylene]-

Chemical Abstracts Service (CAS) Registry No.: 54686-97-4

Other name(s):

Name	CAS No.
Bis(p-methylbenzylidene) sorbitol	54686-97-4
D-p-tolylidene sorbitol	54686-97-4
1,3:2,4 Di(methylbenzylidene) sorbitol	87826-41-3
1,3:2,4-Bis-O-[(methylphenyl)methylene]-D-glucitol	87826-41-3
[1,3]Dioxino[5,4-d]-1,3-dioxin, D-glucitol	87826-41-3
1,3:2,4-bis-O-[(4-methylphenyl)methylene] hexitol	93379-37-4
[1,3]Dioxino[5,4-d]-1,3-dioxin, hexitol deriv.	93379-37-4
1,3:2,4-bis-O-[(4-methylphenyl)methylene]-D-glucitol	81541-12-0
1-[tetrahydro-2,6-bis(4-methylphenyl) [1,3]dioxino[5,4-d]-1,3-dioxin-4-yl]-1,2-ethanediol	79072-95-0
[1,3]Dioxino[5,4-d]-1,3-dioxin,	79072-95-0

1,2-ethanediol deriv.

Bis-O-[(methylphenyl)methylene]-D-glucitol 58956-31-3

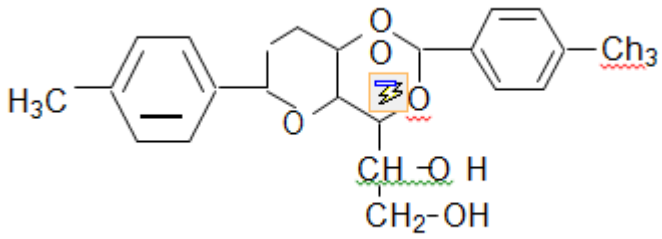
Bis(p-methylbenzylidene) sorbitol 54686-97-4

D-p-tolylidene sorbitol 54686-97-4

Trade name(s): Geniset MD, Gel-All-MD

Molecular formula: $C_{22}H_{26}O_6$

Structural formula:



Molecular weight: 386.5

Method of detection and determination:

A High Performance Liquid Chromatography (HPLC) method using UV detection was submitted.

Spectral data:

Ultraviolet/visible: Compound in dimethylsulphoxide main peak at 258 nm (no absorption from 400-870 nm)

Infra Red (KBr disk): Major peaks at 3232, 1517, 1459, 1415, 1343, 1265, 1099, 1022, 944, 836, 818, 785, 765 and 616 cm^{-1}

1H-NMR and GC/MS spectra were consistent with structure

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	White powder
Melting Point:	235.1 - 235.8°C
Bulk Density:	258 kg/m^3 at 20°C
Specific Gravity:	1,280 Kg/m^3 at 20°C
Vapour Pressure:	4.9 x 10^{-9} kPa at 25°C (gas saturation method)
Water Solubility:	1.5 x 10^{-3} g/L at 25°C
Fat Solubility:	1 mg/100 g fat at 37°C
Partition Co-efficient (n-octanol/water) log $P_{O/W}$:	2.51
Hydrolysis as a function of pH:	Undergoes acid catalysed hydrolysis. Half-life at pH 3.95 approx. 200 hours. Stable over 7 days at pH 7 and 9.
Adsorption/Desorption:	Not applicable as the chemical will be trapped in a polymer matrix.
Dissociation Constant pKa:	Not applicable
Flash Point:	Not applicable
Flammability Limits:	Brief ignition and rapid extinction (hot wire method)
Autoignition Temperature:	>400°C
Explosive Properties:	Does not contain any structural features associated with explosive properties

Reactivity/Stability: Does not react exothermically with oxidising materials

Particle size distribution: range - 0.1 - 170 µm
mean - 13.5 - 18.9 µm
needles 1 - 20 µm length
aggregates 10 - 80 µm diameter

4. PURITY OF THE CHEMICAL

Degree of purity : >95% w/w

Toxic or hazardous impurity/impurities: None

Non-hazardous impurity/impurities: (> 1% by weight)

.Chemical name: 1-[4,4a,8,8a-tetrahydro-2-(4 methylphenyl)-6-(2-methylphenyl) [1,3]dioxino[5,4-d]-1,3-dioxin-4-yl]-1,2-ethanediol
CAS No.: 93128-36-0
Weight percentage: 3.5% w/w
Chemical name: 2,2',2"-tris(4-methylphenyl)-4,4':5',4"-ter[1,3]dioxolane
Synonym(s): Trimethybenzylidene sorbitol
Weight percentage: 1.5% w/w

Additive(s)/Adjuvant(s): None

5. INDUSTRIAL USE

Geniset MD will be used as a nucleating/clarifying agent in polyolefins, particularly polypropylene. The notified chemical will be applied in thin wall injection moulding, film sheet extrusion, blow moulding and rotational moulding.

Geniset MD was notified in Europe towards the end of 1988.

It is estimated that the yearly import volume of Geniset MD will increase from 1-10 tonnes in the first year to 10- 100 tonnes by the fifth year.

6. OCCUPATIONAL EXPOSURE

Geniset MD will be imported and transported to the reformulation site in 10 kg polyethylene-lined multi-ply sacks, contained in a "Jaxpal" box (20 sacks per box) on a wooden pallet. It is estimated that 6-12 workers will be involved in the transport and storage of the packaged chemical.

At the customer site, individual 10 kg sacks of Geniset MD will be manually added to an enclosed blender and mixed with other powdered chemicals. The blended powder will then be transferred to 200 L plastic lined drums. Loading and unloading of the blender will be carried out under local exhaust ventilation in an isolated section of the plant.

The blended powder containing Geniset MD will be added to polypropylene powder via an additive feeder which gravimetrically controls the addition of the notified chemical. A dust extraction process will ensure that fine dust does not escape into the atmosphere.

Approximately 30 plant operators will be involved in the two blending operations. The duration of exposure will be for 3 to 4 hours per day for the first blending operation and 2 hours per day for the second. These operations will be carried out 35-45 days per year.

Maintenance and cleaning workers will be exposed for 1 hour per month for 12 days per year and quality control personnel will be exposed for 6 days per year.

7. PUBLIC EXPOSURE

There is low potential for public exposure to Geniset MD during manufacturing processes, which take place under local exhaust ventilation with dust extraction. Any waste generated during polypropylene manufacture will be disposed of at an approved landfill. Virtually all Geniset MD will eventually be released into the environment when finished articles are disposed of after use, but at this stage the notified chemical will be incorporated into the polypropylene matrix.

There is potential for widespread public exposure to low doses of Geniset MD in the diet, caused by migration from polypropylene food and drink containers. Additional exposure may arise from

injectable solutions following contact with polypropylene syringes containing the notified chemical. This aspect has not been addressed by the notifier but is likely to result in only very low exposure.

8. ENVIRONMENTAL EXPOSURE

. Release

The notifier has stated that under normal operating conditions for a polymer Compounder/Processor release of the chemical to the environment cannot occur. The dust extraction process, used during such times, should keep any generated dust within the system and ensure that none is released to the atmosphere.

When the additive feeder system undergoes inspection, cleaning or maintenance, it is emptied thoroughly. The following sections, when opened, may be contaminated with trace amounts of the chemical: additive feeder, additive feed hopper and the diverter feed valve.

The notifier estimates that less than 1 kg per year of waste would be generated from the manufacture of polypropylene from each individual Compounder/Processor site. The notifier expects that four major production sites will take the material. Disposal of the 4 kg or less of the chemical will probably be via an external waste management authority to an approved land waste site for burial.

The maximum loading of the chemical in the final article is up to 0.5% w/w. A typical thin walled container application is said to achieve maximum benefit by the addition of 0.1-0.3% w/w.

Moulders and Thermoformers manufacturing finished articles will add about another 250 kg per year (combined total waste from all sites) of encapsulated chemical in polypropylene granules at an average loading of 0.25% w/w (ie 0.63 kg of the chemical). Disposal of this material will be as follows:

Injection moulding; Spillage will account for approximately 100 kg waste/year. The granules would be swept up and sent for burial at a land fill site. The runner material would either be recycled in-house or sold to a recycler.

Blow moulding; Comments as above. Spillage would account for approximately 100 kg waste/year.

Thermoforming; Off-cuts of sheet material are either recycled in-house or sold to a recycler.

The notifier has stated that if an incineration route is chosen as the method of disposal it is recommended that a minimum temperature of 1100°C is achieved with a residence time of 3 seconds.

. **Fate**

Geniset MD will enter the environment when waste generated from the manufacture of polypropylene and the finished articles, and articles containing Geniset MD are disposed of to land fill.

It is unlikely that Geniset MD will migrate from the polymer matrix and leach into groundwater under environmental conditions. Polypropylene plaques containing Geniset MD were immersed into distilled water, acetic acid (3% w/v) and ethanol (15% w/v) for 2 hours at 70°C and 10 days at 40°C. The plaques were also immersed in olive oil for 10 days at 40°C. The results showed that no significant migration occurs from polypropylene under exaggerated exposure conditions.

Incineration of the chemical and the finished articles will produce oxides of carbon.

- Biodegradation

Geniset MD was tested for its ready biodegradability using the Modified MITI test - OECD Guideline 301C, at a nominal concentration of 100 $mg.L^{-1}$. This test measures biodegradability as a percentage of biochemical oxygen demand (BOD). After 28 days of incubation the extent of biodegradation amounted to 10%.

A second study on the assessment of the biodegradability of the chemical was conducted using the "Closed bottle test" - OECD Guideline 301D, at a nominal concentration of 2 $mg.L^{-1}$. This test measures biodegradability as the BOD expressed as a percentage of either the theoretical oxygen demand or the chemical oxygen demand. After 28 days of incubation the extent of biodegradation amounted to 2-7%.

Therefore, from the above results Geniset MD cannot be considered as readily biodegradable.

- Hydrolysis

The hydrolysis characteristics of Geniset MD were studied using a method based on OECD TG 111, at 25°C, under abiotic conditions. Solutions at three pHs (approximately pH 4, 7, 9) were analysed over a seven day period. Geniset MD was found to be stable over seven days at pH 7 and at pH 9 as a reduction in concentration was not observed. A significant and consistent drop in concentration was only observed under acidic conditions. This indicates that the test material is subject to acid catalysed hydrolysis. At pH 4 a 45% drop in concentration was observed over a seven day interval. The half-life was determined to be approximately 200 hours. The hydrolysis products were identified as sorbitol and p-tolualdehyde.

- Bioaccumulation

Characteristics of organic chemicals which exhibit bioaccumulation are a molecular weight >100 giving a maximum capacity at about 350, then declining to a low capacity about 600, and a log Kow between 2 and 6 (1). Geniset MD's molecular weight of 386, log Kow of 2.5, low water solubility and low biodegradability, indicates it may bioaccumulate. However, Geniset MD's low fat solubility may preclude this from occurring. Also, Geniset MD is unlikely to enter the aquatic environment due to its proposed use pattern. Therefore, the overall bioaccumulation potential of Geniset MD is likely to be low from the proposed use.

9. EVALUATION OF TOXICOLOGICAL DATA

9.1 Acute Toxicity

Table 1 Summary of the acute toxicity of Geniset MD

Test	Species	Outcome	Reference
Acute Oral (a)	Rat	LD_{50}>2,100 mg/kg	(2)
Acute Oral (b)	Rat	LD_{50}>12,000 mg/kg	(3)
Acute Dermal	Rat	LD_{50}>2,100 mg/kg	(4)
Acute Inhalational (snout-only 4 hour exposure)	Rat	LC_{50}>670 mg/m^3	(5)
Skin Irritation	Rabbit	Non-irritant	(6)
Eye Irritation	Rabbit	Slight irritant	(7)
Skin Sensitisation	Guinea pig	Non-sensitising	(8)

9.1.1 Oral Toxicity

a) Schering Agrochemicals, UK (2)

Sprague-Dawley rats (5/sex) were given a single oral dose of 2100 mg/kg of Geniset MD (in 0.5% carboxymethylcellulose) by gavage. A control group (5 rats/sex) received vehicle only. Animals were observed for 14 days after treatment.

There were no deaths or treatment related clinical signs and bodyweight was also not affected. Necropsy did not reveal any treatment related effects.

The oral LD_{50} of Geniset MD was >2100 mg/kg in rats.

b) Drug Safety Centre, Japan (3)

Slc-Wistar rats (10/sex/group) were given a single oral dose of Geniset MD (in 5% gum arabic) by gavage at 3,000, 6,000 or 12,000 mg/kg. A control group (5 rats/sex) received vehicle only at 4 mL/100 g bodyweight. Animals were observed for 7 days after treatment.

There were no deaths. Clinical signs were a transient decrease in spontaneous motor activity and piloerection. Bodyweight was also not affected. Necropsy did not reveal any treatment related effects.

The oral LD_{50} of Geniset MD was >12,000 mg/kg in rats.

9.1.2 Dermal Toxicity (4)

Sprague-Dawley rats (5/sex) were given a single dermal dose of 2100 mg/kg of Geniset MD (moistened with 0.5% carboxymethylcellulose) under occlusive bandage for 24 hours. A control group (5 rats/sex) was used. Animals were observed for 14 days after treatment.

There were no deaths or treatment related clinical signs and bodyweight was also not affected. There were no signs of skin irritation. Necropsy did not reveal any treatment related effects.

The dermal LD_{50} of Geniset MD was >2100 mg/kg in rats.

9.1.3 Inhalation Toxicity (5)

Wistar rats (5/sex) were treated with a single 4-hour continuous snout-only inhalational exposure to Geniset MD dust (atmospheric concentration = 0.67 mg/L, 60% of particles with aerodynamic diameter below 5.5 µm). A control group (5 rats/sex) was exposed to clean air in place of the test substance. The animals were observed for a period of 14 days after treatment.

There were no deaths or treatment related clinical signs. Bodyweight, food and water consumption were not affected.

Necropsy did not reveal any treatment related effects and relative lung weight was within normal limits.

The inhalational LC_{50} of Geniset MD was >670 mg/m^3 in rats

9.1.4 Skin Irritation (6)

Geniset MD (0.5 g moistened with water) was applied to clipped dorsal area of three New Zealand White rabbits under semi-occlusive bandage for 4 hours. The application site was examined for signs of irritation at 1, 24, 48, 72 days and 7 days after removal of the dressing.

There was no erythema or oedema in any of the animals at any of the observation times. Signs of local and systemic toxicity were also not apparent.

Geniset MD did not cause skin irritation in rabbits.

9.1.5 Eye Irritation (7)

Geniset MD (30 mg) was instilled into the right eye of each of three New Zealand White rabbits. The left eye served as control. The eyes were examined for signs of irritation at 1, 24, 48, 72 hours and 7 days after instillation of the test substance.

Slight (1/3 animals) to moderate (2/3 animals) erythema of the conjunctivae was observed at 1 hour after instillation. At 24 hours, only slight erythema (2/3 animals) of the conjunctivae was seen.

Geniset MD was a slight eye irritant in rabbits.

9.1.6 Skin Sensitisation (8)

The potential for Geniset MD to cause skin sensitisation was studied in female Dunkin-Hartely guinea pigs using the Buehler method.

In a preliminary study, Geniset MD (in 0.5% carboxymethylcellulose) was applied topically under occlusive dressing to the clipped flanks of 4 guinea pigs at concentrations of 40%, 20%, 10% or 5%. The dressing was removed after six hours and the application sites were examined for signs of irritation

at 24 and 48 hours after removal of the dressing. There were no signs of irritation at any of the concentrations tested. Therefore, 40% was chosen as the maximum non-irritant concentration for both the induction phase and the challenge phase.

In the main study, Geniset MD was applied topically under occlusive dressing to the clipped flanks of 10 guinea pigs at concentrations of 40% for six hours. This procedure was carried out once a week for a period of three weeks. A separate control group consisting of 10 guinea pigs was also used.

Two weeks after the last induction dose, a challenge dose of Geniset MD at 40% was applied topically under occlusive dressing to the left flank and at 20% applied to the right flank. The dressing was removed after six hours and the application sites were examined for signs of irritation at 24, 48 and 72 hours after removal of the dressing. There were no signs of irritation at either concentration.

Geniset MD did not cause skin sensitisation under the conditions of this experiment.

9.2 Repeated Dose Toxicity

9.2.1 One Month Oral Toxicity Study (9)

Geniset MD (in 0.5% carboxymethylcellulose) was administered by gavage to Sprague-Dawely rats (5/sex/dose) at doses of 0, 11, 110 or 1100 mg/kg/day for 28 days.

There were no deaths or treatment related clinical signs during this study. Bodyweight gain and food consumption in the treated animals were comparable to those in control animals. Haematology, conducted at the end of the study, did not reveal any treatment related effects. Clinical chemistry, conducted at the end of the study, showed a decrease in total bilirubin in treated males, however the effect was not dose-dependent.

At necropsy, gross examination did not reveal any treatment related changes. There was a dose-dependent increase in the absolute kidney weight in the mid and high dose males. The relative kidney weight was also increased in these animals, although this effect was not dose-dependent. Histology did not reveal any treatment related effects.

9.2.2 Three Months Oral Toxicity Study (10)

In a study conducted by the Drug Safety Research Centre, Japan, Geniset MD was administered to SLc-Wistar rats (10/sex/dose) in food at levels of 0 (control), 1.25% (750 mg/kg/day) 2.5% (1,500 mg/kg/day) or 5% (3,000 mg/kg/day) for 90 days.

There were no deaths or treatment related clinical signs during the course of this study. Bodyweight gain was decreased in the high dose males form week 5 onwards which resulted in these males weighing 19% less than control males by week 13. Food consumption in the treated animals was higher than that in control group. Water intake was not affected. Haematology, clinical chemistry and urinalysis were carried out at the end of the study. Haematology showed a slight dose-dependent decrease in the segmented neutrophil cell count in the males, although the magnitude of the change was within normal limits. Clinical chemistry revealed a 30% increase in alkaline phosphatase activity in the high dose females. However, this group showed a large standard error in this determination. Individual animal data were not available. Urinalysis did not reveal any treatment related effects.

At necropsy, gross examination did not reveal any abnormalities. Absolute and relative pituitary, heart, liver and spleen weights were decreased in the high dose males, but these changes did not reach statistical significance. Absolute and relative prostrate weights were increased in a dose-dependent manner in treated males. Microscopic examination showed mononuclear cell infiltration of the liver in 4/10 high dose females while the incidence was 1/10 in control females. The report does not contain a comment as to the likelihood of this finding being related to the treatment.

9.3 Genotoxicity

9.3.1.1 *Salmonella typhimurium* Reverse Mutation Assay (11)

Geniset MD was tested for its potential to cause gene mutations in the *Salmonella typhimurium* reverse mutation assay using the TA 1535, TA 1537, TA 1538, TA 98 and TA 100 strains. In a preliminary dose range finding study, concentrations of up to 5000 µg/plate (limit of solubility) of Geniset MD in acetone , with or without metabolic activation, were not cytotoxic in any of the strains. Consequently concentrations of 0, 50, 150, 500,

1500 and 5000 µg/plate were used in the main study. Geniset MD did not cause an increase in revertant colonies, both in the presence or absence of metabolic activation, in any of the strains. 2-Aminoanthracene was used as the positive control substance for all the strains in the presence of metabolic activation. In the absence of metabolic activation, N-ethyl-N'-nitro-N-nitrosoguanidine was used as a positive control for TA 1535 and TA 100, 2-nitrofluorene was used for TA 1538 and TA 98, and 9-aminoacridine was used for TA 1537.

Geniset MD was not mutagenic under the conditions of this assay.

9.3.1.2 *Salmonella typhimurium* and *Escherichia coli* Reverse Mutation Assay (12)

In a second bacterial mutagenicity assay, Geniset MD was tested for its potential to cause gene mutations in the *Salmonella typhimurium* reverse mutation assay using the TA 1535, TA 1537, TA 1538, TA 98 and TA 100 strains and ***Escherichia coli*** WP2uvrA strain.

Concentration of Geniset MD of 5, 10, 50, 100, 500 or 1000 µg/plate did not increase the frequency of revertant colonies in any of the bacterial strains tested. 2-Aminoanthracene was used as the positive control substance for all the strains in the presence of metabolic activation. In the absence of metabolic activation, N-ethyl-N'-nitro-N-nitrosoguanidine was used as a positive control for TA 1535, TA 100 and WP2uvrA, 2-nitrofluorene was used for TA 1538 and TA 98, and 9-aminoacridine was used for TA 1537.

Geniset MD was not mutagenic under the conditions of this assay.

9.3.2 Cytogenetics in Cultured Human Lymphocytes (13)

Geniset MD was tested for its potential to cause chromosomal aberrations in cultured human lymphocytes arrested in metaphase.

In a preliminary cytotoxicity study, cultured human lymphocytes were incubated for 2 hours with Geniset MD (in dimethylsulphoxide) at concentrations of 0.06, 0.12, 0.23, 0.47, 0.94, 1.88, 3.75, 7.5, 15 or 30 µg/mL. The assays were carried out with and without metabolic activation. The mitotic index was not decreased both in the presence and absence of metabolic

activation at any of the concentrations, with the exception of the highest dose tested (30 µg/mL) with metabolic activation.

In the main study, cultured human lymphocytes were incubated for 48 hours with Geniset MD (in dimethylsulphoxide) at concentrations of 3, 15, 22.5 or 30 µg/mL, both with and without metabolic activation. The cells were arrested in metaphase with colchicine and examined for chromosomal aberrations. A total of 100 metaphase spreads were examined from each culture.

No statistically significant increase was seen in the proportion of aberrant cells at any of the dose levels in either the presence or absence of metabolic activation.

Cyclophosphamide and ethylmethane sulphonate were used as positive controls and gave the expected increase in the proportion of aberrant cells.

Geniset MD did not cause chromosomal aberrations under the conditions of this experiment.

9.4 Overall Assessment of Toxicological Data

Geniset MD was shown to have low acute oral toxicity in rats. Two rat acute oral toxicity studies were submitted. One of these studies showed the oral LD_{50} for Geniset MD to be greater than 2,100 mg/kg and in the other study the LD_{50} was greater than 12,000 mg/kg. This substance was also shown to have low acute dermal toxicity in the rat with an LD_{50} being greater than 2,100 mg/kg. The acute inhalational toxicity of Geniset MD was low with an LC_{50} of greater than 670 mg/m^3.

Geniset MD was not a primary skin irritant in rabbits, but did cause slight irritation in the rabbit eye. The notified chemical did not cause skin sensitisation when tested in guinea pigs.

Two repeated dose oral toxicity studies were submitted; a one month and a three month study. In both studies there were no histological changes which could be clearly attributed to the effect of the test substance.

Two bacterial mutagenicity assays were conducted using Geniset MD and both assays showed the test substance to be devoid of mutagenic activity. A cytogenetics assay using cultured human

lymphocytes was also conducted on Geniset MD. This assay showed Geniset MD not to possess clastogenic activity.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

The following studies for Geniset MD have been provided.

Test	Species	Result
Acute toxicity	Rainbow trout	96h LC50 >0.10 $mg.L^{-1}$
		NOEL >0.10 $mg.L^{-1}$
Acute toxicity	Daphnia magna	48h EC50 >0.10 $mg.L^{-1}$
		NOEL >0.10 $mg.L^{-1}$
Acute toxicity	Earthworms	14 day LC50 >1000 $mg.kg_{-1}$

The above studies were conducted according to OECD test guidelines. For the aquatic toxicity studies, the notifier has stated that 0.10 $mg.L^{-1}$ was the highest test concentration that could be prepared due to the limited solubility of the test material in water and having regard to the amount of auxiliary solvent permitted in the test. It is unclear why this value is significantly lower than the 1.5 $mg.L^{-1}$ listed under physico-chemical data.

The above tests indicate that Geniset MD is unlikely to be toxic to the species tested up to limits of its solubility.

The notifier has stated that no daphnia magna reproduction or alga growth inhibition studies were performed on the basis of its low water solubility, the mode of use of the chemical, the remote likelihood of the chemical entering the aquatic environment and the unavailability of the chemical to aquatic systems due to the form of the final product. CEPA concurs with the notifier's reasons for exemption of these studies for the proposed use.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The proposed use of Geniset MD as an additive in polypropylene is unlikely to present an environmental hazard as low amounts only of the notified substance will be disposed of to landfill where it is unlikely to migrate from the polymer matrix under environmental conditions.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The toxicity profile of Geniset MD indicated that it is a slight eye irritant and has low acute inhalational toxicity. Therefore, eye contact with the chemical should be minimised.

The molecular weight and partition co-efficient of the notified chemical suggest that it may be able to be absorbed across the skin. It has a low vapour pressure, however the particle size distribution indicates that some dust particles would be in the respirable range.

The use pattern for Geniset MD indicates that the potential routes of exposure are oral, dermal and inhalational. However, with the proposed and proper handling procedures the exposure to the notified chemical within the workplace should be minimal.

There is potential for widespread public exposure to low doses of Geniset MD via food and drink stored in containers which incorporate the notified chemical. There may be additional exposure via injectable solutions contacting syringes which incorporate the notified chemical, but no quantitative estimate can be made from existing data.

Under normal use conditions, Geniset MD would be expected to present a low risk to human health.

13. RECOMMENDATIONS

To minimise occupational exposure to Geniset MD the following guidelines and precautions should be observed:

. if engineering controls and work practices are insufficient to reduce exposure to Geniset MD a safe level [Worksafe

Australia has set an exposure standard of 10 mg/m^3 for nuisance inspirable dust (14)], the following personal protective equipment should be used:

- a dust mask complying with AS 1716 (15) and AS 1715 (16);
- safety glasses or goggles complying with AS 1337 (17) and AS 1336 (18);
- gloves complying with AS 2161 (19); and
- protective clothing complying with AS 3765.2 (20) and AS 3765.3 (21);

- good personal hygiene should be practiced; and
- a copy of the Material Safety Data Sheet should be easily accessible to employees.

14. MATERIAL SAFETY DATA SHEET

The Material Safety Data Sheet (MSDS) for Geniset MD (Attachment 1) was provided in Worksafe Australia format (22). This MSDS was provided by Robert Bryce & Co. Limited as part of their notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of Robert Bryce & Co. Limited.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act), secondary notification of Geniset MD shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise.

A secondary notification will be required if the use pattern results in an increased aquatic exposure.

16. REFERENCES

1. Connell D W, "Bioaccumulation of Xenobiotic Compounds", CRC Pres p56. 1990.

2. Schering Agrochemicals, UK, Technical Gel-All-MD: Acute Oral Toxicity in the Rat. Data on file, Report Tox/88/29-114, 1988.

3. Drug Safety Research Centre, Japan, Testing the Acute Toxic Effects of Gel-All-MD on Rats. Data on file, 1982.

4. Schering Agrochemicals, UK, Technical Gel-All-MD: Acute Dermal Toxicity in the Rat. Data on file, Report Tox/88/29-115, 1988.
5. Schering Agrochemicals, UK, Technical Gel-All-MD: Acute Inhalational (4 hour exposure) Toxicity study in Rats. Data on file, Report Tox/88/29-117, 1988.

6. Schering Agrochemicals, UK, Technical Gel-All-MD: Assessment of Skin Irritation in Rabbits. Data on file, Report Tox/88/29-119, 1988.

7. Schering Agrochemicals, UK, Technical Gel-All-MD: Assessment of Eye Irritation in Rabbits. Data on file, Report Tox/88/29-118, 1988.

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