

File No: NA/547

December 1997

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**Notified Chemical in Bricorr 288**

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Director  
Chemicals Notification and Assessment

**FULL PUBLIC REPORT****Notified Chemical in Bricorr 288****1. APPLICANT**

Albright and Wilson Specialities Pty Ltd of 313 Middleborough Road BOX HILL VIC 3128 has submitted a standard notification statement in support of their application for an assessment certificate for Notified Chemical in Bricorr 288.

**2. IDENTITY OF THE CHEMICAL**

**Chemical Name:** 2-butenedioic acid (Z)-, disodium salt, reaction products with disodium phosphonate

**Chemical Abstracts Service (CAS) Registry No.:** 143239-08-1

**Other Names:** Mixture of neutralised phosphonate ITC288

**Trade Name:** Bricorr 288 (contains 40% of the notified chemical)

**Method of Detection and Determination:** in addition to infrared and nuclear magnetic resonance spectroscopy an ion-exchange method is available

**Spectral Data:** ultraviolet/visible, infrared, proton and <sup>13</sup>C-nuclear magnetic resonance spectra to confirm structure were provided

**3. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance:** white crystalline solid

**Melting Point:** 367 °C (decomp.)

<b>Specific Gravity:</b>	notified substance: 1.9386 at $24.5 \pm 0.5$ °C  Bricorr 288: 1.4 (40% solution of notified substance)
<b>Vapour Pressure:</b>	$3.1 \times 10^{-2}$ Pa
<b>Water Solubility:</b>	>70% w/w at $20.0 \pm 0.5$ °C
<b>Fat Solubility:</b>	< 0.05 mg/100 g at $37.0 \pm 0.5$ °C
<b>Hydrolysis:</b>	<10% hydrolysis at 50°C in pH 4, 7 and 9 buffer solutions
<b>Partition Co-efficient:</b> (octanol/water)	$\log P_{OW} < -2.98$
<b>Adsorption/Desorption:</b>	$\log K_{OC} < 1.77$
<b>Dissociation Constant:</b>	not determined (see comments below)
<b>Surface Activity:</b>	46.1 mN.m <sup>-1</sup> at $20.0 \pm 0.5$ °C (20.1% w/w solution) 71.9 mN.m <sup>-1</sup> at $21.5 \pm 0.5$ °C (0.10% w/w solution)

### Comments on Physico-Chemical Properties

Tests were performed according to EEC/OECD test guidelines (1,2) at facilities complying with OECD Principles of Good Laboratory Practice.

The  $\log K_{OC}$  for the notified substance is consistent with its high water solubility and low octanol/water partition coefficient and indicates that it will not adsorb strongly to organic matter. The notifier has suggested that the notified substance will readily adsorb to soils and sediments by analogy with other phosphonates (3). However, the compounds to which the analogy is drawn are all polyphosphonates with no other charged moieties. The notified substance is a mixture of two compounds which are both monophosphonates and contain two and four carboxylate functionalities. Hence, the validity of this analogy is uncertain and consequently so is the degree to which the notified substance will adsorb.

The degree of dissociation of the compounds in the notified substance at the pH (6.6-7.5) in the cooling towers is uncertain. Both compounds contain carboxylate and phosphonate functionalities which are capable of accepting protons. The presence of the neighbouring charged groups in molecule will effect the  $pK_a$  values of each group. This effect is greater the closer the groups are together.

Concentrated solutions of the notified substance are expected to be surface active, while dilute solutions will not be not surface active. By definition, a chemical has surface activity when the surface tension is less than 60 mN.m<sup>-1</sup> (4).

#### 4. PURITY OF THE CHEMICAL

**Degree of Purity:** 76%

The notifier has indicated that it is not possible to isolate the second component using preparative ion chromatography. Hence, it is not possible to calibrate the ion chromatograph with the second component. As a result analytical errors are introduced. The notifier also claims that the notified substance contains higher homologues.

**Toxic or Hazardous Impurities:** none

**Non-hazardous Impurities (> 1% by weight):**

<i><b>Name</b></i>	<i><b>CAS Number</b></i>	<i><b>% Weight</b></i>
disodium maleate	371-47-1	2.1
trisodium phosphate	7601-54-9	2.0

**Additives/Adjuvants:** none

#### 5. USE, VOLUME AND FORMULATION

The notified chemical is to be used as a corrosion inhibitor and anti-scale agent in industrial cooling water. It will be imported as a 40% (w/w) aqueous solution.

#### 6. OCCUPATIONAL EXPOSURE

The notified chemical will be imported in 200 L drums and transported by road. Exposure of transport and storage workers is not expected to occur unless drums are accidentally ruptured.

A small number of drums of Bricorr 288 may be repackaged into 10 or 20 L containers at the notifier's site. It is estimated that repackaging will take about 1 to 1.5 hours per drum once or twice a year. Repackaging is accomplished using a drum pump in which a "spear" is inserted into the drum. Some dermal and ocular exposure may occur from residues on the spear, cleaning transfer lines, and from drips and spills.

The formulation of the water treatment products is a batch process and will occur in closed lid stainless steel blending tanks. The notified chemical is added directly from the import containers into the blending tank using an electrically powered drum pump. After blending to concentrations of 10% or 4%, 200 L drums will be automatically filled with the product. It is estimated that the operator is

potentially exposed to the notified chemical for approximately 5 minutes per drum when opening the drum, inserting and removing the drum pump. Each drum is rinsed with water and the rinsate pumped into the blending vessel. Following filling of drums with the final products, drum bungs are inserted taking approximately 2 minutes per drum. It is possible the 15 L and 1 000 L containers could also be used.

The notifier has estimated the duration of worker exposure as 6 to 7 hours per year during decanting and 32 hours per year fitting and securing drum bungs.

At the point of use automatic dosing pumps are set up by a water treatment technician which involves connecting the drums to the pumps. The notifier estimates that the potential duration of skin exposure for a typical technician is 10 to 12 hours per year. Pictorial information provided by the notifier suggests that the potential for exposure is low.

## **7. PUBLIC EXPOSURE**

There is very low potential for the public to be exposed to the notified chemical throughout its life cycle. It is estimated that no more than 0.1% of the notified chemical be wasted as a result of spills or drum residue. When in industrial cooling systems, the notified chemical will be part of the normal "blowdown", which is usually diverted to a wastewater treatment system or directed to a trade waste sewer. "Windage" losses may occur from cooling towers, but the daily loss of water as mist droplets is estimated at only 0.1% from cooling towers fitted with a demister. Persons entering the mist plume would be exposed to the notified chemical at up to 30 ppm in the water droplets, primarily by the dermal and inhalational routes. However, cooling towers are usually remote from public access, and the likelihood of prolonged or repeated public exposure is assessed as very low.

## **8. ENVIRONMENTAL EXPOSURE**

### **Release**

A small number of drums of Bricorr 288 may be repackaged into 10 or 20 L containers at the notifier's site. Wastes generated from the repackaging of the imported product, resulting from spills and residues in empty containers, would be less than 500 g per annum. This will be discharged through onsite waste water treatment plant to a trade waste sewer.

The formulation of the water treatment products is a batch process and will occur in closed lid stainless steel blending tanks. The notified chemical is added directly from the import containers into the blending tank using an electrically powered drum pump. After blending, 200 L drums will be automatically filled with the product. The notifier estimates that the overall losses would be less than 250 kg. These losses will be disposed of through the formulator's onsite waste water

treatment plant to a trade waste sewer.

The water treatment products containing the notified substance will be added to the cooling system via automated metering equipment which will maintain the concentration on the notified substance at between 15 and 20 ppm.

Release of cooling water containing the notified substance may occur via drift (small droplets entrained in cooled air), leaks, or blowdown (removal of liquid to avoid excessive build up of naturally occurring salts in cooling water). Liquid effluents are expected to be contained on-site before discharge to sewer. City buildings are required to connect to sewer for such discharge. The annual release of the notified substance will be less than 500 kg.

### **Fate**

The substance was examined for biodegradation potential using OECD Test Guideline 301C [modified MITI Test (I)] for ready biodegradability (2). The substance exhibited 9% degradation, indicating that it is not readily biodegradable under the conditions of the test. It was also found that the substance was not inhibitory to bacteria under these conditions. It is also hydrolytically stable. Given the low partition coefficient, high water solubility, hydrolytic stability and lack of biodegradability it is anticipated that the notified substance will remain dissolved in waste water and will not be removed during sewerage treatment. This is supported by Level 1 Mackay calculations that indicate that at equilibrium approximately 0%, 0%, 99.5% and 0.5% will be partitioned to soil, sediment, water and air, respectively. Some caution should be exercised as the values (vapour pressure =  $3.1 \times 10^{-2}$  Pa, water solubility = 700 mg.L<sup>-1</sup> and log K<sub>OW</sub> = -2.98) used in the Mackay modelling were limit values. The notified substance is not expected to bioaccumulate due to its high water solubility and low partition coefficient (5).

## **9. EVALUATION OF TOXICOLOGICAL DATA**

### **9.1 Acute Toxicity**

#### **Summary of the acute toxicity of Notified Chemical in Bricorr 288**

<b>Test</b>	<b>Species</b>	<b>Outcome</b>	<b>Reference</b>
acute oral toxicity	rat	LD <sub>50</sub> > 5 000 mg.kg <sup>-1</sup>	(6)
acute dermal toxicity	rat	LD <sub>50</sub> > 2 000 mg.kg <sup>-1</sup>	(7)
skin irritation	rabbit	slight irritant	(8)
eye irritation	rabbit	slight irritant	(9)
skin sensitisation	guinea pig	skin sensitiser	(10)

### 9.1.1 Oral Toxicity (6)

<i>Species/strain:</i>	rat/Sprague-Dawley
<i>Number/sex of animals:</i>	5/sex
<i>Observation period:</i>	14 days
<i>Method of administration:</i>	single oral dose
<i>Clinical observations:</i>	none
<i>Mortality:</i>	none
<i>Morphological findings:</i>	none
<i>Test method:</i>	according to OECD guidelines (2)
<i>LD<sub>50</sub>:</i>	> 5 000 mg.kg <sup>-1</sup>
<i>Result:</i>	the notified chemical was of low acute oral toxicity in rats

### 9.1.2 Dermal Toxicity (7)

<i>Species/strain:</i>	rat/Sprague-Dawley
<i>Number/sex of animals:</i>	5/sex
<i>Observation period:</i>	14 days
<i>Method of administration:</i>	semi-occluded patch; dermal application of the solid chemical for 24 hours to intact skin
<i>Clinical observations:</i>	none
<i>Mortality:</i>	none
<i>Morphological findings:</i>	none
<i>Test method:</i>	according to OECD guidelines (2)
<i>LD<sub>50</sub>:</i>	> 2 000 mg.kg <sup>-1</sup>
<i>Result:</i>	the notified chemical was of low acute dermal toxicity in rats; no signs of skin irritation were noted during the study

### 9.1.3 Inhalation Toxicity

not determined

### 9.1.4 Skin Irritation (8)

<i>Species/strain:</i>	rabbit/NZW
<i>Number/sex of animals:</i>	6 male
<i>Observation period:</i>	72 hours
<i>Method of administration:</i>	0.5 g of solid moistened with 0.5 mL distilled water; covered with gauze patch for 4 hours
<i>Test method:</i>	in-house protocol similar to OECD guidelines (2)
<i>Result:</i>	slight erythema was noted in 3 animals 1 hour after patch removal; no other erythema or oedema was observed throughout the observation period; the notified chemical was slightly irritating to the skin of rabbits

### 9.1.5 Eye Irritation (9)

<i>Species/strain:</i>	rabbit/NZW
<i>Number/sex of animals:</i>	6 male
<i>Observation period:</i>	72 hours
<i>Method of administration:</i>	0.1 g of powder into the conjunctival sac of the right eye



*Draize scores (11) of unirrigated eyes:*

Time after instillation									
Animal	1 day			2 days			3 days		
Cornea	o <sup>a</sup>		a <sup>b</sup>	o <sup>a</sup>		a <sup>b</sup>	o <sup>a</sup>		a <sup>b</sup>
1	0 <sup>1</sup>		0	0		0	0		0
2	0		0	0		0	0		0
3	1		1	1		0	0		0
4	1		1	1		0	0		0
5	1		1	0		0	0		0
6	0		0	0		0	0		0
Iris									
1	0			0			0		
2	0			0			0		
3	1			0			0		
4	1			0			0		
5	1			0			0		
6	0			0			0		
Conjunctiva	r <sup>c</sup>	c <sup>d</sup>	d <sup>e</sup>	r <sup>c</sup>	c <sup>d</sup>	d <sup>e</sup>	r <sup>c</sup>	c <sup>d</sup>	d <sup>e</sup>
1	2	1	0	1	1	0	0	0	0
2	1	1	1	1	0	1	0	0	0
3	2	2	2	1	1	0	0	0	0
4	1	1	1	1	0	0	0	0	0
5	2	1	1	1	1	0	1	1	0
6	1	1	0	1	0	0	0	0	0

<sup>1</sup> see Attachment 1 for Draize scales

<sup>a</sup> opacity <sup>b</sup> cornea <sup>c</sup> redness <sup>d</sup> chemosis <sup>e</sup> discharge

**Test method:** in-house method similar to OECD guidelines (2)

**Result:** the notified chemical was a slight eye irritant in rabbits

#### 9.1.6 Skin Sensitisation (10)

**Species/strain:** guinea pig/Dunkin-Hartley

**Number of animals:** 20 test; 10 control

*Induction procedure:* 3 pairs of injections of 0.1 mL: Freund's Complete Adjuvant (FCA) in distilled water (1:1); 1.0% (w/v) notified chemical in a 1:1 preparation of FCA in distilled water; 1.0% (w/v) notified chemical in distilled water

at day 7: topical application of the notified chemical: 0.2 - 0.3 mL of a 75% (w/w) solution in distilled water covered by occlusive dressing for 48 hours

*Challenge procedure:* at day 21: 0.1 - 0.2 mL of a 25% (w/w) or a 50% (w/w) solution in distilled water under occlusive dressing for 24 hours

*Challenge outcome:*

<b>Challenge concentration</b>	<b>Test animals</b>			<b>Control animals</b>		
	<b>24*</b>	<b>48*</b>	<b>72*</b>	<b>24*</b>	<b>48*</b>	<b>72*</b>
25%	1/20**	2/20	1/20	0/10	0/10	0/10
50%	10/20	7/20	0/20	0/10	0/10	0/10

\* hours after patch removal

\*\* number of animals exhibiting positive response

*Test method:* similar to OECD guidelines (2)

*Result:* the notified chemical was sensitising to the skin of guinea pigs

## 9.2 Repeated Dose Toxicity (12)

*Species/strain:* rat/Sprague-Dawley CD

*Number/sex of animals:* 5/sex/dose group

*Method of administration:* oral gavage

*Dose/Study duration::* 0, 150 (low), 400 (mid), 1 000 (high) mg.kg.dy<sup>-1</sup> for 28 days

*Clinical observations:* high dose females exhibited signs of piloerection, increased salivation and red/brown staining of fur from day 23 onwards

<i>Clinical chemistry/Haematology</i>	slight changes in plasma alkaline phosphatase in high dose animals
<i>Histopathology:</i>	no treatment-related microscopic changes
<i>Test method:</i>	according to OECD guidelines (2)
<i>Result:</i>	the notified chemical exhibited no target organ toxicity

### 9.3 Genotoxicity

#### 9.3.1 *Salmonella typhimurium* and *Escherichia coli* Reverse Mutation Assay (13)

<i>Strains:</i>	TA 1535, TA 1537, TA 98, TA 100, <i>E. coli</i> strain WP2 <i>uvrA</i>
<i>Concentration range:</i>	312.5 - 5 000 µg.plate <sup>-1</sup>
<i>Test method:</i>	according to OECD guidelines (2)
<i>Result:</i>	the notified chemical did not induce back mutation to prototrophy in the bacterial strains tested

#### 9.3.2 Micronucleus Assay in the Bone Marrow Cells of the Mouse (14)

<i>Species/strain:</i>	mouse/CD1
<i>Number and sex of animals:</i>	5/sex/group
<i>Doses:</i>	0, 1 000 mg.kg <sup>-1</sup>
<i>Method of administration:</i>	intraperitoneal
<i>Test method:</i>	according to OECD guidelines (2)
<i>Result:</i>	no induction of micronuclei in bone marrow polychromatic erythrocytes was observed

### 9.3.3 Chromosomal Aberrations in Chinese Hamster Lung Cells (15)

<i>Species/strain:</i>	Chinese Hamster/lung cells
<i>Concentration Range:</i>	6 hour and 12 hour treatments; 625 - 5 000 $\mu\text{g.mL}^{-1}$ , with or without rat liver S9 fraction for 48 hour treatment; 312.5 - 2 500 $\mu\text{g.mL}^{-1}$ 24 hour continuous treatment
<i>Test method:</i>	in-house method similar to OECD guidelines (2)
<i>Result:</i>	the notified chemical exhibited a statistically significant increase in the frequency of cells with chromosomal aberrations at 1 250 $\mu\text{g.mL}^{-1}$ with 48 hour continuous treatment and was, therefore, weakly clastogenic in CHL cells <i>in vitro</i>

### 9.4 Overall Assessment of Toxicological Data

The notified chemical exhibited low acute oral ( $\text{LD}_{50} > 5\,000\text{ mg.kg}^{-1}$ ) and dermal ( $\text{LD}_{50} > 2\,000\text{ mg.kg}^{-1}$ ) toxicity in rats. It was a slight skin and eye irritant in rabbits and was a skin sensitiser in guinea pigs. No target organ was identified in a 28-day oral repeat dose study at doses up to  $1\,000\text{ mg.kg.dy}^{-1}$ . The notified chemical was not mutagenic in bacteria or clastogenic in mouse bone marrow polychromatic erythrocytes but was a weak inducer of chromosomal aberrations in Chinese Hamster Lung cells.

The notified chemical would be classified as hazardous according to NOHSC's *Approved Criteria for Classifying Hazardous Substances* (16) in relation to sensitising effects.

## 10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

<i>Test</i>	<i>Species</i>	<i>Results</i>
Acute Toxicity (96 h, static)	rainbow trout <i>Oncorhynchus mykiss</i>	LC <sub>50</sub> > 100 mg.L <sup>-1</sup> NOEC 100 mg.L <sup>-1</sup>
Acute Toxicity (48 h, static)	<i>Daphnia magna</i>	EC <sub>50</sub> > 1000 mg.L <sup>-1</sup> NOEC 1000 mg.L <sup>-1</sup>
Growth Inhibition	Algae <i>Scenedesmus</i> <i>capricornutum</i>	E <sub>b</sub> C <sub>50</sub> > 100 mg.L <sup>-1</sup> (72 h) E <sub>b</sub> C <sub>50</sub> > 100 mg.L <sup>-1</sup> (96 h) E <sub>3</sub> C <sub>50</sub> > 100 mg.L <sup>-1</sup> (28-48 h) NOEC 100 mg.L <sup>-1</sup>
Respiration Inhibition	Micro-organisms in aerobic activated sludge	IC <sub>50</sub> > 1000 mg.L <sup>-1</sup> (30 min) NOEC 1000 mg.L <sup>-1</sup> (30 min) IC <sub>50</sub> > 1000 mg.L <sup>-1</sup> (3 h) NOEC 1000 mg.L <sup>-1</sup> (3 h)

The effects of the notified substance were examined in limit tests at a nominal concentration of 100 mg.L<sup>-1</sup> in the fish and algal ecotoxicity tests. The effects on *Daphnia* were examined at two concentrations (100 and 1000 mg.L<sup>-1</sup>). No adverse effects on the test organisms noted in any of the tests. A white precipitate was observed in the 100 mg.L<sup>-1</sup> concentration in the *Daphnia* which was attributed to calcium sequestration.

Polycarboxylic acid compounds with neighbouring carboxylic acid functionalities have been shown to exhibit moderate toxicity to algae (17). As the notified substance is a polycarboxylate it might be expected to show some toxicity to algae. However, the toxicity of polycarboxylic compounds to algae is mitigated by the presence of calcium ions (17). Hence, the lack of toxicity to algae shown by the notified substance may be explained by the presence of calcium ions (18 mg.L<sup>-1</sup>) in the test media.

The ecotoxicity data for the notified substance indicate that the notified substance is practically non-toxic to fish, daphnia, algae and sewerage micro-organisms.

## 11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The notifier has provided an estimate of the predicted environmental concentration (PEC) as a result of the formulation process and the end-use of the notified substance in cooling towers. The proposed scenarios and the calculations are presented below:

### **Formulation of water treatment products\***

Estimated loss per day:	2.08 kg
Waste water flow in sewer:	400 ML.day <sup>-1</sup>
<b>PEC:</b>	<b>0.005 mg.L<sup>-1</sup></b>

\*The notifier estimates that discharges would occur on a maximum of 20 days per year.

### **End-use in a cooling tower**

Concentration:	20 mg.L <sup>-1</sup>
Water volume in tower:	15 000 m <sup>3</sup>
% loss of cooling water:	1%
Waste water flow to sewer:	200 kL.day <sup>-1</sup>
dilution factor	10
<b>PEC:</b>	<b>0.15 mg.L<sup>-1</sup></b>

Both the above release scenarios assume no adsorption by the notified substance to sediment in the sewer or sludge in the sewerage treatment works. Partitioning to the sludge is expected to occur if the waste water is treated to remove phosphorus, otherwise the notified substance is likely to be discharged to natural waters. Any adsorption to sediment or sewerage sludge (as a result of treatment) would lower the PECs for the notified substance. Both PECs are at least three orders of magnitude below the lowest NOEC observed in the ecotoxicity studies. Hence, the overall environmental hazard potential of the chemical can be rated as low, particularly as further dilutions are expected in receiving waters.

## **12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS**

The primary health hazard posed by the notified chemical is the potential for skin sensitisation. The chemical also may be a weak skin and eye irritant and a weak clastogen. It is not likely to exhibit acute or chronic toxicity.

Workers will be involved in transport and storage of 200 L drums containing a 40% aqueous solution of the notified chemical, in a small amount of repackaging, in reformulation into water treatment products and in attachment of drums to water treatment systems. The likelihood of significant exposure to the notified chemical during any of these operations is slight.

In repackaging, the imported solution is pumped into other containers. This is likely to occur infrequently for a short duration so that the risk of skin sensitisation is low. Nevertheless, gloves, overalls and eye protection as described below should be worn.

In reformulation, the imported solution is pumped into blending tanks and the blend automatically filled into 200 L drums. Again these operations occur infrequently for short duration but personal protective equipment should be worn to prevent exposure as there is still a low risk of skin sensitisation.

End use involves attaching the drums to a water treatment metering system. Again the potential for exposure is expected to be low but personal protective equipment should be worn.

The risk of adverse health effects to members of the public during transport, repackaging, reformulation and waste disposal operations is expected to be negligible. The public may be exposed to mist from cooling towers. However, the maximum concentration of the notified chemical in cooling tower mist is 30 ppm so that there is negligible risk to public health.

### **13. RECOMMENDATIONS**

To minimise occupational exposure to the notified chemical the following guidelines and precautions should be observed for handling and use of Bricorr 288:

- Safety spectacles with side shields should be selected and fitted in accordance with Australian Standard (AS) 1336 (18) to comply with Australian/New Zealand Standard (AS/NZS) 1337 (19);
- Industrial clothing should conform to the specifications detailed in AS 2919 (20);
- Impermeable gloves or mittens should conform to AS 2161 (21);
- All occupational footwear should conform to AS/NZS 2210 (22);
- Spillage of the notified chemical should be avoided, spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;
- Good personal hygiene should be practised to minimise the potential for ingestion;
- A copy of the relevant MSDS should be easily accessible to employees, and disclosure of the chemical name should be made on the MSDS and label in accordance with NOHSC's *National Model Regulations for Control of Workplace Hazardous Substances* (23).

### **14. MATERIAL SAFETY DATA SHEET**

The MSDS for the Bricorr 288 was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (24).

This MSDS was provided by the applicant as part of the notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of the applicant.

## 15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, secondary notification of the notified chemical shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

## 16. REFERENCES

1. EEC Commission Directive on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous preparations, *Official Journal of the European Communities*.
2. Organisation for Economic Co-operation and Development, *OECD Guidelines for Testing of Chemicals*, OECD, Paris, France.
3. Gledhill WE and Feijtel TCJ 1992, *Environmental Properties and Safety Assessment of Organic Phosphonates Used for Detergent and Water Treatment Applications*, pp 261-285, in, Hutzinger, O. & de Oude, N.T. (eds), *Handbook of Environmental Chemistry, Vol 3: Part F, Anthropogenic Compounds: Detergents*, Springer-Verlag, Berlin.
4. European Economic Community (EEC), EEC Directive 92/69, Annex V, Part A, *Methods for the determination of physico-chemical properties*, A.5 "Surface Tension" EEC Publication No. L383. December 1992.
5. Connell DW 1989, *General characteristics of organic compounds which exhibit bioaccumulation*. In: Connell DW ed, *Bioaccumulation of Xenobiotic Compounds*. CRC Press, Boca Raton, USA.
6. Tufnell PP 1992, *ITC 288: Acute Oral Toxicity (Limit Test) in the Rat*, Project Number 71/110, Safepharm Laboratories Limited, Derby, U.K.
7. Tufnell PP 1992, *ITC 288: Acute Dermal Toxicity (Limit Test) in the Rat*, Project Number 71/111, Safepharm Laboratories Limited, Derby, U.K.
8. Tufnell PP 1992, *ITC 288: Acute Dermal Irritation in the Rabbit*, Project Number 71/112, Safepharm Laboratories Limited, Derby, U.K.
9. Tufnell PP 1992, *ITC 288: Acute Eye Irritation in the Rabbit*, Project Number 71/113 Safepharm Laboratories Limited, Derby, U.K.
10. Tufnell PP 1992, *ITC 288: Magnusson & Kligman Maximisation Study in the Guinea Pig*, Project Number 71/114, Safepharm Laboratories Limited, Derby, U.K.
12. Coles LJ and Brooks PN 1992, *ITC 288: Twenty-Eight Day Sub-acute Oral Toxicity Study in the Rat*, Project Study 71/115, Safepharm Laboratories Limited, Derby, U. K.



13. Thompson PW 1992, *ITC 288: Reverse Mutation Assay "Ames Test" using Salmonella typhimurium and Escherichia coli*, Project 71/116, Safepharm Laboratories Limited, Derby, U. K.
14. Durward R 1992, *ITC 288: Micronucleus Test in the Mouse*, Project Number, Safepharm Laboratories Limited, Derby, U. K.
15. Wright NP 1992, ITC 288: Metaphase Analysis in CHL Cells *In Vitro*, Project Number 71/117, Safepharm Laboratories Limited, Derby, U. K.
16. National Occupational Health and Safety Commission 1994, *Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1994)]*, Australian Government Publishing Service, Canberra.
17. Nabholz JV, Miller P and Zeeman M 1993, 'Environmental Risk Assessment of New Substances under the Toxic Substances Control Act Section Five'. In W G Landis, J S Hughes and M A Lewis (Eds), *Environmental Toxicology and Risk Assessment, American Society for Testing and Materials*, ASTM STP 1179, Philadelphia. pp 40-55.
18. Standards Australia, 1994, *Australian Standard 1336-1994, Recommended Practices for Eye Protection in the Industrial Environment*, Standards Association of Australia Publ., Sydney.
19. Standards Australia, Standards New Zealand 1992, *Australian/ New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ. Wellington, New Zealand.
20. Standards Australia, 1987, *Australian Standard 2919 - 1987 Industrial Clothing*, Standards Association of Australia Publ., Sydney.
21. Standards Australia 1978, *Australian Standard 2161-1978, Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standards Association of Australia Publ., Sydney.
22. Standards Australia, Standards New Zealand 1994, *Australian/ New Zealand Standard 2210 - 1994 Occupational Protective Footwear, Part 1: Guide to Selection, Care and Use. Part 2: Specifications*, Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ. Wellington, New Zealand.
23. National Occupational Health and Safety Commission 1994, *Control of Workplace Hazardous Substances [NOHSC:1005(1994), 2007(1994)]*, Australian Government Publishing Service, Canberra.
24. National Occupational Health and Safety Commission 1994, *National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]*, AGPS, Canberra.

## Attachment 1

The Draize Scale for evaluation of skin reactions is as follows:

<b>Erythema Formation</b>	<b>Rating</b>	<b>Oedema Formation</b>	<b>Rating</b>
No erythema	0	No oedema	0
Very slight erythema (barely perceptible)	1	Very slight oedema (barely perceptible)	1
Well-defined erythema	2	Slight oedema (edges of area well-defined by definite raising)	2
Moderate to severe erythema	3	Moderate oedema (raised approx. 1 mm)	3
Severe erythema (beet redness)	4	Severe oedema (raised more than 1 mm and extending beyond area of exposure)	4

The Draize scale for evaluation of eye reactions is as follows:

### **CORNEA**

<b>Opacity</b>	<b>Rating</b>	<b>Area of Cornea involved</b>	<b>Rating</b>
No opacity	0 none	25% or less (not zero)	1
Diffuse area, details of iris clearly visible	1 slight	25% to 50%	2
Easily visible translucent areas, details of iris slightly obscure	2 mild	50% to 75%	3
Opalescent areas, no details of iris visible, size of pupil barely discernible	3 moderate	Greater than 75%	4
Opaque, iris invisible	4 severe		

### **CONJUNCTIVAE**

<b>Redness</b>	<b>Rating</b>	<b>Chemosis</b>	<b>Rating</b>	<b>Discharge</b>	<b>Rating</b>
Vessels normal	0 none	No swelling	0 none	No discharge	0 none
Vessels definitely injected above normal	1 slight	Any swelling above normal	1 slight	Any amount different from normal	1 slight
More diffuse, deeper crimson red with individual vessels not easily discernible	2 mod.	Obvious swelling with partial eversion of lids	2 mild	Discharge with moistening of lids and adjacent hairs	2 mod.
Diffuse beefy red	3 severe	Swelling with lids half-closed	3 mod.	Discharge with moistening of lids and hairs and considerable area around eye	3 severe
		Swelling with lids half-closed to completely closed	4 severe		

### **IRIS**

<b>Values</b>	<b>Rating</b>
Normal	0 none
Folds above normal, congestion, swelling, circumcorneal injection, iris reacts to light	1 slight
No reaction to light, haemorrhage, gross destruction	2 severe