File No: LTD/1450

March 2010

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

NIR-IM1

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Department of Health and Ageing, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Department of the Environment, Water, Heritage and the Arts.

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

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

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

Director
NICNAS

TABLE OF CONTENTS

FULL PUBLIC REPORT

NIR-IM1

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Fuji Xerox Australia Pty Ltd
101 Waterloo Rd
North Ryde NSW 2113

NOTIFICATION CATEGORY
Limited-small volume: Chemical other than polymer (1 tonne or less per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication: Chemical name, Other names, CAS number, Molecular formula, Structural formula, Molecular weight, Methods of detection and determination, Spectral data, Import volume, Use details, Identity of manufacturer/recipients

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

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
NCE, 2007

NOTIFICATION IN OTHER COUNTRIES
China, 2007

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
NIR-IM1, Cyan Toner (product containing the notified chemical at <1%)

MOLECULAR WEIGHT
>1000 Da

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

3. COMPOSITION ALL

DEGREE OF PURITY >99%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS None

NON HAZARDOUS IMPURITIES/RESIDUAL MONOMERS (>1% by weight) None

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20°C AND 101.3 kPa: Black solid

Property	Value	Data Source/Justification
Melting Point	176°C	Measured
Boiling Point	---	Determination was not possible as the test material decomposed on melting.
Density	1.17 kg/m^3 at 20.5°C	Measured
Vapour Pressure	<4.2 x 10^{-8} kPa at 25°C	Measured
Water Solubility	< 1.0 x 10^{-4} g/L at 20°C	Measured
Hydrolysis as a Function of pH	Not tested	The notified chemical is not expected to hydrolyse over the environmental pH range (4–9)
Partition Coefficient (n-octanol/water)	log Pow = 9.86	Calculated by fragment constant methodology
Adsorption/Desorption	log Koc > 6.15	Estimated by QSAR equation
Dissociation Constant	pKa = 2.6, 2.2, 1.8 and 1.4	Calculated. In addition to the ionisable groups, the notified chemical contains functional groups that will retain a permanent cationic charge, hence the notified chemical will be ionised over the environmental pH range (4–9)
Particle Size	Inhalable fraction (<100 μm): 15.4% Thoracic fraction (<10.2 μm): 4.29% Respirable fraction (<5.4 μm): 0.688%	Measured
Flash Point	---	Not applicable for solid
Solid Flammability	Highly flammable	Measured
Autoignition Temperature	None below its melting point	Measured
Not explosive	Measured	Not explosive

DISCUSSION OF PROPERTIES

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

The notified chemical has low vapour pressure (<4.2 x 10^{-8} Pa at 25°C), it is highly flammable solid, and not explosive. As the notified chemical has been found to be highly flammable, the oxidising properties test was not applicable. The notified chemical is expected to have oxidising properties from the chemical structure of perchlorate.

Reactivity

The notified chemical is considered to be stable, with no degradation or decomposition expected under normal conditions of use. However, it may contribute to a fire based on its solid flammability properties. Contact with heat, organic chemicals, flammable materials or metal powder should be avoided.

Dangerous Goods classification

Based on the submitted physical-chemical data in the above table (solid flammability), the notified chemical is classified as follows according to the Australian Dangerous Goods Code (NTC,2007).

Class 4.1 – Flammable solids

However, the data above does not address all Dangerous Goods endpoints. Therefore consideration of all endpoints should be undertaken before a final decision on the Dangerous Goods classification is made by the introducer of the chemical.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified chemical will not be manufactured in Australia and will be imported as an ingredient of a toner in sealed cartridges.

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

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

PORT OF ENTRY
Sydney

IDENTITY OF MANUFACTURER/RECIPIENTS
Recipients will be located in NSW.

TRANSPORTATION AND PACKAGING
The notified chemical will be imported into Australia as an ingredient of a toner (<1), inside sealed cartridges. The toner cartridge will be packaged in high-intensity plastic bags housed inside cardboard boxes. Packaging also includes Toner Cartridge Bottle and Developer Cartridge Bottle. Toner cartridge bottles are also packed with two bottles per carton containing a foam styrol cushion.

USE
The notified chemical will be used as an ingredient of a toner, sealed within a cartridge, at a concentration of <4%. The cartridges are designed exclusively for Fuji Xerox printers.

OPERATION DESCRIPTION
The notified chemical will not be manufactured in Australia, but will instead be imported into Australia as a component (<1%) of a toner, sealed within a cartridge. The cartridges are designed exclusively for Fuji Xerox printers and will be used by office personnel for commercial purposes. No reformulation or repackaging of the product containing the notified chemical will occur in Australia.

The toner cartridge will be supplied within plastic packaging. The customers will open the plastic packaging and then fit the cartridge containing the toner directly into the printer as instructed by the manufacturer. Servicing technicians will be responsible for the maintenance and repairs of printers using cartridges containing the notified chemical.

6. HUMAN HEALTH IMPLICATIONS

6.1 Exposure assessment

6.1.1 Occupational exposure

NUMBER AND CATEGORY OF WORKERS

Category of Worker	*Number*	*Exposure Duration*	*Exposure Frequency*
Transport and Storage workers	>10	1 hour/day	50 days/year
Printing Machine Operators and Service technicians	1-3/workplace	~7 hrs/day	Each working day
End users, Office workers	>100	1 hour/day	50 days/year

EXPOSURE DETAILS
Worker exposure to the notified chemical during the importation, transport and storage of the toner cartridges is not expected, except in the unlikely event of an accident where the cartridge and its packaging may be breached.

Printing machine operators may be exposed to ink containing notified chemical (<1%) during replacing ink cartridges. Generally, everyday machine maintenance and operation will be performed by trained office

workers on a reasonably infrequent basis. Replacement of printing cartridges involves removal of the old printing cartridge from the printing machine and directly loading the new cartridge. Dermal or ocular exposure could also occur when handling faulty or ruptured cartridges. However, exposure is expected to be low and for a brief period of time.

Service technicians may be exposed to the notified chemical during cleaning and repair of the printing machines. Service technicians will be trained in the maintenance of the printing machines and will have access to appropriate PPE such as disposable gloves.

Overall, as the concentration of the notified polymer in the ink is low (<1%), the ink is contained within the cartridge, and replacement of spent cartridge is done infrequently, exposure to the notified polymer during replacement of cartridges is expected to be low. Users will also avoid contact with the cartridge ink where possible, to avoid staining of their skin/or clothing.

6.1.2. Public exposure

The cartridges containing the notified chemical are only for commercial/office use situations and will not be sold to the general public. Therefore, general public will not be exposed to the notified chemical or ink containing the notified chemical as such. However, the general public will be exposed to the paper or other types of material printed with cartridge ink containing the notified chemical. Exposure to the general public, in this case, will be low as the notified chemical will be incorporated in the substrate (printing materials) once the ink has dried and is not expected to be bioavailable.

6.2. Human health effects assessment

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

Endpoint	*Result and Assessment Conclusion*
Rat, acute oral toxicity	LD50 >2000 mg/kg bw low toxicity
Rat, acute dermal toxicity	LD50 <2000 mg/kg bw low toxicity
Rabbit, skin irritation	non-irritating
Rabbit, eye irritation	slightly irritating
Mouse, skin sensitisation – Local lymph node assay	no evidence of sensitisation
Rat, repeat dose toxicity – 28 days.	NOAEL = 1000 mg/kg bw/day
Mutagenicity – bacterial reverse mutation	non mutagenic
Genotoxicity – in vitro –human lymphocytes	non genotoxic

Toxicokinetics, metabolism and distribution

No data were available to assess toxicokinetics, metabolism and distribution of the notified chemical. Absorption through the skin is unlikely given the high log Pow (9.86) and molecular weight (>1000 Da).

Acute toxicity

The notified chemical is of low acute oral and dermal toxicity. Toxicity via inhalation has not been tested.

Irritation and Sensitisation

The notified chemical was not irritating to the skin of rabbit and was slightly irritating to the eyes of rabbit. It was not a skin sensitiser in guinea pigs.

Repeated Dose Toxicity

In the 28-day repeat dose oral toxicity study on the notified chemical, treatment-related effects were observed at all dose levels. These effects were confined to microscopic changes in the thyroid gland, consisting of follicular cell hypertrophy and hyperplasia at all dose levels. These changes are typical of a goiterogenic response of the thyroid gland and often occur with excessive stimulation of Thyroid Stimulation Hormone (THS). However, in the absence of apotosis, or degenerative/necrotic findings, this effect is considered to be reversible and as such, would not be considered to represent an adverse health effect.

The No Observed Adverse Effect Level (NOAEL) was established as 1000 mg/kg bw/day in this study, based on some clinical chemistry changes observed at this dose levels.

Mutagenicity
The notified chemical was found to be non-mutagenic in a bacterial reverse mutation test and also showed no evidence of clastogenicity to human lymphocytes *in vitro*, either with or without metabolic activation. Based on these results, the notified chemical is not expected to be a mutagen.

Health hazard classification
Based on the available data, the notified chemical is not classified as hazardous according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human health risk characterisation

6.3.1. Occupational health and safety
The main acute risk from the use of notified chemical is slight eye irritation.

There is a risk for potential occupational exposure to the notified chemical during end use printing application such as replacing ink cartridges, handling faulty or ruptured cartridges, and printing. Service technicians may be exposed to the notified chemical during cleaning and repair of the printing machines. However, occupational exposure is expected to be low and for a brief period of time during replacement of ink cartridges and printing. Any exposure during servicing and maintenance is also expected to be low and for a brief period of time.

Therefore, considering the exposure level and low hazards of the notified chemical, the risk of occupational exposure is expected to be low during printing, servicing and maintenance.

6.3.2. Public health
As the toner containing the notified chemical in a sealed cartridges are only for commercial/office use situations and will not be sold to the general public, general public will not be exposed to the notified chemical or ink containing the notified chemical as such. Therefore, the risk is not considered to be unacceptable to general public.

The general public will be exposed to the paper or other types of material printed with cartridge ink containing the notified chemical. Risk to the general public will be low as the notified chemical will be incorporated in the substrate (printing materials) once the ink has dried and is not expected to be bioavailable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1 Environmental Exposure

RELEASE OF CHEMICAL AT SITE
The notified chemical will be imported into Australia as a component of a final product in ready-to-use cartridges. Environmental release of the notified chemical is unlikely to occur during importation, storage and transportation. If leakage or spillage does occur, the toner will be physically contained with absorbent material and disposed of to landfill.

RELEASE OF CHEMICAL FROM USE
The toner cartridges will be designed to prevent leakage and will not be opened during transport, use, installation or replacement. Therefore, release of toner containing the notified chemical to the environment is not expected under normal conditions of use. If leakage or spillage does occur, the toner will be physically contained with absorbent material and disposed of to landfill.

Cartridges will be contained within the printer until the contents are consumed and then they will be removed and sent for recycling or disposed of to landfill. Approximately 0.1% of the toner containing the notified chemical will remain in “empty” cartridges.

RELEASE OF CHEMICAL FROM DISPOSAL
Most of the notified chemical will be bound to printed paper, which will be either disposed of to landfill or recycled. It is assumed that 50% of the waste paper will end up in landfill and the rest will undergo paper recycling processes. During recycling processes, waste paper is repulped using a variety of chemical agents

which, amongst other things, enhance detachment of toner from the fibres. Very little of the notified chemical is expected to partition to the supernatant water, due to its low water solubility, which is released to the sewer. The notified chemical is expected to partition to sludge generated during the washing process, which will be sent to landfill for disposal.

7.1.2 Environmental fate

The notified chemical is not readily biodegradable. For the details of the environmental fate studies, refer to Appendix C.

Most of the notified chemical will be sent to landfill via either direct disposal of waste paper containing the notified chemical or disposal of sediment sludge produced from the waste paper recycling processes. In landfill, the notified chemical will be bound to soil, based on its adsorption coefficient and low water solubility, and will be slowly degraded to form water and oxides of carbon and nitrogen. The notified chemical is not expected to be bioavailable or bioaccumulative due to its molecular weight.

7.1.3 Predicted Environmental Concentration (PEC)

The PEC for the notified chemical has not been calculated since no significant release to the environment is expected based on its reported use pattern.

7.2. Environmental effects assessment

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

Endpoint	*Result*	*Assessment Conclusion*
Fish Toxicity	LC50 (96 h) >38.6 mg/L	Not harmful to fish, at least up to the limit of its solubility in water*
Daphnia Toxicity	EL50 (48 h) >0.1 mg/L NOEL (48 h) = 0.1 mg/L	Not harmful to aquatic invertebrates, up to the limit of its solubility in water
Algal Toxicity	EL50 (72 h) >0.1 mg/L	Not harmful to algae, up to the limit of its solubility in water
Inhibition of Bacterial Respiration	EC50 (3 h) >1000 mg/L	Not expected to be harmful to microbial respiration

*An auxiliary solvent was used to aid in the dissolution of the notified chemical

In one laboratory, the daphnia and algae tests were conducted on a filtered water accommodated fraction (WAF) with nominal loading rates (0.1 mg/L) based on the water solubility value of the notified chemical. An analytical method for the quantitative determination of soluble test material was reported to not be possible due to the insolubility of the notified chemical. Hence, the endpoint values are quoted on nominal loading rates. In another laboratory, the fish toxicity test was conducted using acetonitrile to aid the dissolution of the notified chemical, hence, the actual concentration of the notified chemical in the test medium was found to be higher than its limit of solubility in water. Based on the test results above, the notified chemical is expected not to be harmful to the aquatic compartment, up to the limit of its solubility.

7.2.1 Predicted No-Effect Concentration

The PNEC was calculated using the NOEL endpoint for daphnia toxicity (0.1 mg/L) and an assessment factor of 100 as three acute test results are available.

Predicted No-Effect Concentration (PNEC) for the Aquatic Compartment		
NOEL (Daphnia, 48 h)	0.1 mg/L	mg/L
Assessment Factor	100	
PNEC:	1.0	µg/L

7.3. Environmental risk assessment

The notified chemical is unlikely to be released into aquatic ecosystems in environmentally significant concentrations based on the intended use pattern and the potential for removal of the notified chemical from waste water steams by physical processes, especially adsorption to solids. As there is very little potential for aquatic exposure of the notified chemical based on the reported use pattern, the notified chemical is not expected to pose a risk to the environment.

8. CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
Based on the available data, the notified chemical is not classified as hazardous according to the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)].

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

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

Environmental risk assessment
On the basis of the reported use pattern, the notified chemical is not expected to pose a risk to the environment.

Recommendations

REGULATORY CONTROLS
Hazard Classification and Labelling

- The notified chemical should be classified as follows under the ADG Code:
  -- Class 4.1 – Flammable solids

CONTROL MEASURES
Occupational Health and Safety

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical as introduced in the product Cyan Toner:
  – Avoid contact with eyes

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

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

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

Environment

Disposal

- The notified chemical should be disposed of to landfill.

Emergency procedures

- Spills or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

Regulatory Obligations

Secondary Notification
This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the chemical under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified chemical is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

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

or

(2) Under Section 64(2) of the Act; if
  - the function or use of the chemical has changed from component of printer ink at <1% concentration, sealed within a cartridge, or is likely to change significantly;
  - the chemical has begun to be manufactured in Australia
  - additional information has become available to the person as to an adverse effect of the chemical on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

Material Safety Data Sheet
The MSDS of the notified chemical and product containing the notified chemical provided by the notifier were reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Physico-chemical properties were conducted on the notified chemical NIR-IMI.

Melting Point 176ºC

Method OECD TG 102 Melting Point/Melting Range.
Remarks Determination was carried out by differential scanning calorimetry (DSC). The test material was observed to melt with decomposition from approximately 176ºC and was completely liquefied at 180 ºC.
Test Facility SafePharm Laboratories Ltd (2007a)

Density 1.17 kg/m^3 at 20.5ºC

Method EC Directive 92/69/EEC A.3 Relative Density.
Remarks Determined using a Quantachrome MVP-2 gas comparison pycnometer. The relative density was 1.17.
Test Facility SafePharm Laboratories Ltd (2006a)

Vapour Pressure <4.2 x 10^{-8} kPa at 25ºC

Method OECD TG 104 Vapour Pressure.
Remarks Determined using a vapour pressure balance.
Test Facility SafePharm Laboratories Ltd (2007a)

Water Solubility < 1.0 x 10^{-4} g/L at 20ºC

Method EC Directive 92/69/EEC A.6 Water Solubility.
Remarks Flask Method. An aliquot (100 µL) of stock solution of the notified chemical (in dimethylformamide at 1.05 x 10^3 mg/L) was diluted with double-distilled water (1000 mL). The resulting solution was shaken at 30°C for 72 h, and allowed to equilibrate at 20°C for 24 h. The clear faint green coloured solution was observed visually. An assessment using the Tyndall effect confirmed the notified chemical to be in suspension. The co-solvent was deemed not to affect the validity of the test. Further attempts to determine the actual water solubility were unsuccessful.
A water solubility estimate was generated using computer software WSKOWWIN v1.41 to give a value of 4.3 x 10^{-12} g/L at 25 ºC.
Test Facility SafePharm Laboratories Ltd (2006a)

Hydrolysis as a Function of pH

Remarks The low water solubility of the notified chemical indicated that determination of hydrolysis as a function of pH by Method C7 of EC Directive 92/69/EEC was inappropriate. The notified chemical is not expected to hydrolyse over the environmental pH range (4–9).
Test Facility SafePharm Laboratories Ltd (2006a)

Partition Coefficient (n-octanol/water) log Pow = 9.86

Method KOWWIN v1.67 (US EPA 2000)
Remarks The low solubility of the notified chemical in both water and n-octanol indicated that testing by flask method under Method A8 of EC Directive 92/69/EEC was inappropriate. In addition, the presence of permanent cationic charges in the notified chemical could result in secondary ionic interactions with silanol groups in the HPLC column stationary phase, hence HPLC estimation of partition coefficient was also deemed inappropriate. Instead, the partition coefficient was determined by fragment constant methodology using estimation software (KOWWIN v1.67) to give a log Pow value of 9.86. The software was considered valid for the estimation of the partition coefficient of the notified chemical, as calculated log Pow values of representative fragments of the notified chemical were

within 1 log unit of literature values.
Test Facility SafePharm Laboratories Ltd (2006a)

Adsorption/Desorption log Koc > 6.15

Method QSAR calculation (as per Technical Guidance Document in Support of Commission Directive 93/67/EEC)
Remarks The presence of permanent cationic charges in the notified chemical could result in secondary ionic interactions with silanol groups in the HPLC column stationary phase, hence HPLC estimation of the adsorption coefficient was inappropriate. Instead, the adsorption coefficient was estimated by QSAR calculation using the nonhydrophobic class formula (0.52 x log Pow + 1.02; n = 390, r^2 = 0.63, standard error = 0.56) to give a value of 6.15. The nonhydrophobic class is defined to be all chemicals that do not contain halogen atoms. The QSAR estimates for amine-containing polyaromatic compounds are typically underestimated, and as such the value is reported as a minimum value, which is sufficient to indicate negligible mobility in soil. High affinity for soil particles is expected for chemicals of cationic nature.
Test Facility SafePharm Laboratories Ltd (2006a)

Dissociation Constant pKa = 2.6, 2.2, 1.8 and 1.4

Method Advanced Chemistry Development, Inc., ACD/pKa v8.03
Remarks The low solubility of the notified chemical indicated that the determination of pKa values by Method 112 of the OECD Guidelines for the Testing of Chemicals was inappropriate. Instead, structural information was used to predict the dissociation constants of the notified chemical (using predictive software Advanced Chemistry Development, Inc., ACD/pKa v8.03), which were calculated to be 2.6, 2.2, 1.8 and 1.4 for the protonated species. Other functional groups in the notified chemical retain a permanent cationic charge, irrespective of solution pH, hence the notified chemical will be ionised over the environmental pH range (4–9).
Test Facility SafePharm Laboratories Ltd (2007b)

Particle Size

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

Range (μm)	*Method*	*Result*
Proportion of test material having an inhalable particle size less than 100 μm	Sieve	15.4%
Proportion of test material having a thoracic particle size less than 10.2 μm	Cascade Impactor	4.29%
Proportion of test material having a respirable particle size less than 5.4 μm	Cascade Impactor	0.688%

Remarks Screening test (sieve method) and definitive test (cascade impactor method) were used.
Test Facility SafePharm Laboratories Ltd (2006a)

Solid Flammability Highly flammable

Method EC Directive 92/69/EEC A.10 Flammability (Solids).
Remarks A preliminary screening test and a main test were conducted. The test material has been determined to be highly flammable as it propagated combustion over the 100 mm of the main test in under 45 seconds.
Test Facility SafePharm Laboratories Ltd (2007c)

Autoignition Temperature None below its melting point

Method EC Directive 92/69/EEC A.16 Relative Self-Ignition Temperature for Solids.
Remarks The test material was heated in an oven and the relative self-ignition temperature determined. The oven temperature was programmed to increase from ambient to 195°C, which was approximately 15°C higher than the melting temperature. After the test, the cube contained black charred remains. Therefore, the test material has been determined not to have a relative self-ignition temperature below its melting temperature.

Test Facility SafePharm Laboratories Ltd (2007a)

Explosive Properties Determined not to have explosive properties

Method EC Directive 92/69/EEC A.14 Explosive Properties.
Remarks The test material was subjected to BAM fall hammer test, BAM friction test, and Koenen steel tube test for the determination of explosive properties.
Test Facility SafePharm Laboratories Ltd (2007c)

APPENDIX B: TOXICOLOGICAL INVESTIGATIONS

All toxicological properties were conducted on the notified chemical NIR-IMI.

B.1. Acute toxicity – oral

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 423 Acute Oral Toxicity – Acute Toxic Class Method. EC Directive 92/69/EEC B.1tris Acute Oral Toxicity – Acute Toxic Class Method.
Species/Strain	Rat/Sprague-Dawley CD, female
Vehicle	Test substance was administered as a suspension in arachis oil BP.
Remarks - Method	No significant protocol deviations. A group of three fasted females were treated with test material at a dose level of 2000 mg/kg bw. This was followed by a further group of three fasted females at the same dose level.
RESULTS	
LD50	>2000 mg/kg bw
Signs of Toxicity	There were no signs of systemic toxicity and there were no deaths. All animals showed expected gains in body weight over the study period.
Effects in Organs	There were no remarkable necropsy findings.
CONCLUSION	The notified chemical is of low toxicity via the oral route.
TEST FACILITY	SafePharm Laboratories Ltd (2006b)

B.2. Acute toxicity – dermal

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 402 Acute Dermal Toxicity.
Species/Strain	Rat/Sprague-Dawley
Vehicle	The test substance was applied as such, moistened sufficiently with water.
Type of dressing	Semi-occlusive.
Remarks - Method	No significant protocol deviations. After a single dermal application of 2000 mg/kg bw in 10 rats (5 males, 5 females), mortality, clinical signs, body weights, and necropsy findings were observed for 14 days.
RESULTS	
LD50	>2000 mg/kg bw
Signs of Toxicity - Local	None
Signs of Toxicity - Systemic	There were no treatment related clinical signs observed.
Effects in Organs	There were no treatment related effects observed in organs.
Remarks - Results	
CONCLUSION	The notified chemical is of low toxicity via the dermal route.
TEST FACILITY	Safety Assessment Headquarter (2007)

B.3. Irritation – skin

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 404 Acute Dermal Irritation/Corrosion. EC Directive 2004/73/EC B.4 Acute Toxicity (Skin Irritation).
Species/Strain	Rabbit/New Zealand White
Number of Animals	3 (male)
Vehicle	None.
Observation Period	72 hours
Type of Dressing	Semi-occlusive.
Remarks - Method	No significant protocol deviations. 0.5 g of the test material was moistened with 0.5 mL of distilled water and applied for 4 hours.

RESULTS

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

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

CONCLUSION	The notified chemical is non-irritating to the skin.
TEST FACILITY	SafePharm Laboratories Ltd (2006c)

B.4. Irritation – eye

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 405 Acute Eye Irritation/Corrosion. EC Directive 2004/73/EC B.5 Acute Toxicity (Eye Irritation).
Species/Strain	Rabbit/New Zealand White
Number of Animals	3
Observation Period	72 hours
Remarks - Method	No significant protocol deviations. 0.1 mL of the test substance was used in a single dose and instilled into the conjunctival sac of the left eye.

RESULTS

Lesion	*Mean Score* Animal No.*			*Maximum Value*	*Maximum Duration of Any Effect*	*Maximum Value at End of Observation Period*
	1	2	3			
Conjunctiva: redness	0.66	0.66	0.33	1	48 hours	0
Conjunctiva: chemosis	0	0	0	0	0	0
Conjunctiva: discharge	0.33	0.33	0	1	24 hours	0
Corneal opacity	0	0	0	0	0	0
Iridial inflammation	0	0	0	0	0	0

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

Remarks - Results	Black residual test material was noted around all treated eyes at the 1-hour observation. Black staining of fur was noted around all treated eyes throughout the study.
CONCLUSION	The notified chemical is slightly irritating to the eye.
TEST FACILITY	SafePharm Laboratories Ltd (2006d)

B.5. Skin sensitisation – mouse local lymph node assay (LLNA)

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 429 Skin Sensitisation: Local Lymph Node Assay EC Directive 2004/73/EC B.42 Skin Sensitisation (Local Lymph Node Assay)
Species/Strain	Mouse/CBA/Ca (female)
Vehicle	Dimethyl fomamide
Remarks - Method	No significant protocol deviations.

RESULTS

Concentration (% w/w)	*Proliferative response (DPM/lymph node)*	*Stimulation Index (Test/Control Ratio)*
Test Substance		
0 (vehicle control)	569.39	1
5	955.74	1.68
10	851.80	1.50
25	1142.42	2.01
Positive Control (α-Hexylcinnamaldehyde)		
5	-	2.50
10	-	4.03
25	-	9.13

Remarks - Results	No signs of systemic toxicity were noted in the test or control animals during the test. Black staining of the ears and fur was noted in all test animals one hour post dosing Days 1, 2 and 3. Body weight changes of the test animals between Day 1 and Day 6 were comparable to those observed in the corresponding control group animals over the same period. There were no deaths. A positive control was not tested concurrently as part of this test. However, a previous test using α-Hexylcinnamaldehyde at 25% produced a stimulation index of 9.13, confirming the sensitivity of the assay to predict sensitising potential (see above).
CONCLUSION	There was no evidence of induction of a lymphocyte proliferative response indicative of skin sensitisation to the notified chemical.
TEST FACILITY	SafePharm Laboratories Ltd (2006e)

B.6. Repeat dose toxicity

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 407 Repeated Dose 28-day Oral Toxicity Study in Rodents.
Species/Strain	Rat/Sprague-Dawley (CD)
Route of Administration	Oral – gavage
Exposure Information	Total exposure days: 28 days Dose regimen: 7 days per week Post-exposure observation period: Nil
Vehicle	Arachis oil BP
Remarks – Method	No significant protocol deviations. Clinical signs, functional observations, body weight development and food and water consumption were monitored during the study. Haematology and blood chemistry were evaluated for all animals at the end of the study. All animals were subjected to gross necropsy examination and histopathologial evaluation of selected tissues was performed.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw/day*	*Mortality*
control	5 M, 5 F	0	0
low dose	5 M, 5 F	15	0
mid dose	5 M, 5 F	150	0
high dose	5 M, 5 F	1000	0
control recovery		Not performed	
high dose recovery		Not performed	

Mortality and Time to Death

There were no unscheduled deaths during the 28 day study period.

Clinical Observations

Clinical signs were confined to males treated with 1000 mg/kg bw/day showing red/brown staining around the mouth, increased salivation and isolated incidents of fur staining by the test material. These observations were isolated findings of no toxicological importance.

In behavioural assessments, there were no treatment-related effects during the weekly open field arena observations. All inter and intra group differences in urination, defecation and transfer arousal scores were considered to be a result of normal variation for rats of the strain and age used and was of no toxicological significance.

There were no treatment-related changes detected in the haematological parameters investigated. No toxicologically significant effects were detected for treated animals in comparison to controls.

Laboratory Findings – Clinical Chemistry, Haematology, Urinalysis ALL

There were no treatment-related changes detected in the haematological parameters investigated.
Males treated with 1000 mg/kg/day showed a statistically significant reduction in platelet count when compared to controls ($p<0.01$). No such effect was detected for females from the same treatment group and all values were within the normally expected ranges detected for this parameter. In the absence of any supporting evidence, these reductions were considered to be unrelated to test material toxicity.

With respect to blood chemistry, no toxicologically significant effects were detected for treated animals in comparison to controls. A slight increase in alkaline phosphate was detected for either sex treated with 1000 mg/kg/day and females treated with 150 mg/kg/day; although statistical significance was only achieved for the females ($p<0.05$) in both groups. Females treated with 1000 mg/kg bw also displayed reductions in aspartate aminotransferase and 1000 mg/kg bw/day males showed reductions in glucose ($p<0.05$), inorganic phosphorus ($p<0.01$), and a reduction in cholesterol ($p<0.05$). All values were within the normally expected ranges for these parameters, and in the absence of any histopathological correlates, the slight increases were considered to simply represent enzyme induction, commonly observed following the repeated administration of any xenobiotic.

Slight increases ($p<0.05$) in bilirubin levels were detected in all treated females when compared to controls. However, 1000 mg/kg/day males showed a reduction in bilirubin ($p<0.01$). The significance in each case was minimal and there were no histopathological correlates. In the absence of any supported data, those minor intergroup differences were considered to be unrelated to treatment.

Effects in Organs

There were no treatment-related changes detected in group mean absolute and relative organ weights. Reduction in liver weight, both absolute and relative to terminal body weight, were detected for animals of either sex treated with 1000 mg/kg bw/day, although statistical significance was only achieved for males ($p<0.01$). Reduction in heart weight, both absolute and relative to terminal bodyweight, were also observed for males treated with 1000 mg/kg bw/day (($p<0.01$). In the absence of any histopathological correlation, these reductions were considered unrelated to treatment.

There were no treatment-related macroscopic changes detected at terminal kill.

In the thyroid gland, follicular cell hypertrophy/hyperplasia was observed as a consequence of treatment for animals of either sex treated with 150 and 1000 mg/kg bw/day and convincingly for males only treated with 15 mg/kg bw/day. No such effects were evident for females treated with 15 mg/kg bw/day.

Remarks – Results

The administration of the notified chemical by oral gavage for a period of 28-consecutive days resulted in treatment-related effects at all dose levels. These effects were confined to microscopic changes in the thyroid gland, consisting of follicular cell hypertrophy and hyperplasia at all dose levels. The study authors confirmsthat these changes are typical of a goiterogenic response of the thyroid gland and often occur with excessive stimulation of Thyroid Stimulation Hormone (THS). In the absence of apotosis, or degenerative/necrotic findings, this effect was considered to be reversible and as such, was not considered to represent an adverse health effect.

CONCLUSION

The NOAEL was established as 1000 mg/kg bw/day in this study, based on some clinical chemistry findings observed at this dose level.

TEST FACILITY SafePharm Laboratories Ltd (2007d)

B.7. Genotoxicity – bacteria

TEST SUBSTANCE Notified chemical

METHOD OECD TG 471 Bacterial Reverse Mutation Test.
EC Directive 2000/32/EC B.13/14 Mutagenicity – Reverse Mutation Test using Bacteria.

Species/Strain	*S. typhimurium*: TA1535, TA1537, TA98, TA100 *E. coli*: WP2uvrA$^-$
Metabolic Activation System	S9 fraction from phenobarbitone/β-naphthoflavone-induced rat liver.
Concentration Range in Main Test	a) With metabolic activation: 50, 150, 500, 1500, 5000 µg/plate b) Without metabolic activation: 50, 150, 500, 1500, 5000 µg/plate
Vehicle	Dimethyl Sulfoxide
Remarks - Method	No significant protocol deviations. For the plates dosed in the absence of S9, a pink colour was noted from 1500 µg/plate with an associated powdery precipitate observed at 5000 µg/plate. For the plates dosed in the presence of S9, a very fine, pink precipitate and opaque film were observed at µg/plate. None of these observations prevented the scoring of revertant colonies.

RESULTS

Metabolic Activation	*Test Substance Concentration (µg/plate) Resulting in:*			
	Cytotoxicity in Preliminary Test	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Test 1	>5000	>5000	5000	Negative
Test 2	Not performed	>5000	5000	Negative
Present				
Test 1	>5000	>5000	5000	Negative
Test 2	Not performed	>5000	5000	Negative

Remarks - Results All the positive control chemicals (N-ethyl-N'-nitro-N-nitrosoguanidine, 9-Aminoacridine, 4-Nitroquinoline-1-oxide, 2-Aminoanthracene, benzo(a)pyrene) used in the test induced marked increases in the frequency of revertant colonies, both with and without metabolic activation. Thus, the sensitivity of the assay and the efficacy of the S9-mix were validated.

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

TEST FACILITY SafePharm Laboratories Ltd (2006f)

B.8. Genotoxicity – in vitro

TEST SUBSTANCE Notified chemical

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

Species/Strain	Human
Cell Type/Cell Line	Lymphocytes
Metabolic Activation System	S9 fraction from phenobarbitone/β-naphthoflavone-induced rat liver.
Vehicle	Dimethyl Sulfoxide
Remarks - Method	

Metabolic Activation	*Test Substance Concentration (µg/mL)*	*Exposure Period*	*Harvest Time*
Absent			
Test 1	0*, 156.25, 312.5, 625, 1250*, 2500*, 5000*, MMC 0.4*	4 hours	20 hours
Test 2	0*, 156.25, 312.5, 625, 1250*, 2500*, 5000*, MMC 0.2*	24 hours	24 hours
Present			
Test 1	0*, 156.25, 312.5, 625, 1250*, 2500*, 5000*, CP 4*	4 hours	20 hours
Test 2	0*, 156.25, 312.5, 625, 1250*, 2500*, 5000*, CP 4*	4 hours	20 hours

*Cultures selected for metaphase analysis.
MMC= mitomycin C, CP= Cyclophosphamide

RESULTS

Metabolic Activation	*Test Substance Concentration (µg/mL) Resulting in:*			
	Cytotoxicity in Preliminary Test	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Test 1	5000*	5000*	625**	Negative
Test 2	Not performed	5000*	625**	Negative
Present				
Test 1	5000*	5000*	625**	Negative
Test 2	Not performed	5000*	625**	Negative

*There was some evidence of toxicity at the maximum dose level tested.
**A green precipitate of the test material at and above 625 µg/mL was observed in all test groups. However, there was scorable metaphase present up to the maximum tested dose.

Remarks - Results The test material did not induce any statistically significant increases in the frequency of cells with chromosomal aberrations either in the absence or presence of metabolic activation.

All positive control materials induced statistically significant increases the frequency of cells with chromosomal aberrations indicating the satisfactory performance of the test.

CONCLUSION The notified chemical was not clastogenic to human lymphocytes treated in vitro under the conditions of the test.

TEST FACILITY SafePharm Laboratories Ltd (2007e)

APPENDIX C: ENVIRONMENTAL FATE AND ECOTOXICOLOGICAL INVESTIGATIONS

The following tests were conducted on the notified chemical NIR-IMI.

C.1. Environmental Fate

C.1.1. Ready biodegradability

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 301 D Ready Biodegradability: Closed Bottle Test.
Inoculum	Secondary effluent from a domestic wastewater treatment plant
Exposure Period	28 days
Auxiliary Solvent	None reported
Analytical Monitoring	Dissolved oxygen
Remarks - Method	A suspension of the notified chemical in test medium (2 and 5 mg/L) were inoculated with effluent micro-organisms. Completely full, closed bottles of the inoculated test medium were incubated in the dark for 28 days. A positive control (aniline, 2 mg/L) and blank inoculum were run in parallel. Degradation was determined by the analysis of dissolved oxygen in the test medium, corrected for uptake by the blank inoculum, and expressed as a percentage of theoretical oxygen demand (ThOD). The results for the test concentration 5 mg/L achieved 15.2% degradation within 28 days, and the results for the test concentration 2 mg/L and positive control are presented below.

RESULTS

Test substance		*Aniline*	
Day	*% Degradation*	*Day*	*% Degradation*
0	–	0	–
7	12.7	7	72.8
14	16.1	14	76.9
21	27.6	21	84.2
28	32.2	28	90.4

Remarks - Results	The test medium with the notified chemical (2 mg/L) achieved 32.2% degradation by 28 d. The positive control achieved 72.8% degradation by 7 d, and the oxygen depletion in the blank over the course of the test was 1.05 mg/L, thus validating the test. The results have not been adjusted for nitrification.
CONCLUSION	The notified chemical is not readily degradable
TEST FACILITY	Nanjing Institute of Environmental Science, SEPA (2006)

C.1.2. Bioaccumulation

Remarks - Method	Although the notified chemical has a calculated log Pow of 9.86, it is not expected to be bioavailable or bioaccumulative due to its molecular weight.

C.2. Ecotoxicological Investigations

C.2.1. Acute toxicity to fish

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 203 Fish, Acute Toxicity Test – semi-static
Species	Zebrafish (*Brachydanio rerio* H.B)
Exposure Period	96 h
Auxiliary Solvent	Acetonitrile
Water Hardness	Not reported
Remarks – Method	Interpretation of the summary report provided by the notifier indicated

that the notified chemical was initially dissolved in acetonitrile (100 mg notified chemical/100 mL acetonitrile) and further diluted with test water to give a nominal concentration of 100 mg/L. The fish were introduced to the test medium and were observed for mortality over a period of 96 h (test conditions: semi-static, 23°C, pH 6.4–6.7, dissolved oxygen 7.8–8.1 mg/L). A positive control (potassium dichromate) was prepared at concentrations of 100, 200, 300, 400 and 500 mg/L.

RESULTS

Concentration mg/L		*Number of Fish*	*Mortality*				
Nominal	*Actual*		*1 h*	*24 h*	*48 h*	*72 h*	*96 h*
0	0	Not reported	0	0	0	0	0
100	37.1–38.6	10	0	0	0	0	0

LC50	>38.6 mg/L at 96 hours
NOEC	38.6 mg/L at 96 hours
Remarks – Results	There was no mortality in the fish exposed to the notified chemical at a nominal concentration of 100 mg/L. No mortality was observed in the negative control, thus validating the test conditions. The positive control generated the LC50 (24 h) value of 258 mg/L. The actual concentration of the notified chemical was reported to be 37.1–38.6 mg/L, which is higher than its water solubility value and is presumably due to the addition of acetonitrile to aid its dissolution.
CONCLUSION	The notified chemical, at least up to the limit of its solubility, is not harmful to fish.
TEST FACILITY	Nanjing Institute of Environmental Science, SEPA (2006)

C.2.2. Acute toxicity to aquatic invertebrates

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 202 *Daphnia* sp. Acute Immobilisation Test – static EC Directive 92/69/EEC C.2 Acute Toxicity for Daphnia – static
Species	*Daphnia magna*
Exposure Period	48 hours
Auxiliary Solvent	None
Water Hardness	250 mg $CaCO_3$/L
Analytical Monitoring	None
Remarks - Method	After a range-finding test was performed, a limit test was conducted at a single loading rate of 0.1 mg/L under static conditions. The test substance (1.1 mg) was stirred in the test medium (11 L) for 48 h, and undissolved test material was removed by a pre-conditioned filter (filtered WAF). Four replicates of 250 mL of test medium and the control were prepared, and each had five daphnia added. The daphnia were observed for immobilisation over two days (test conditions: artificial light dark cycle of 16 to 8 hours, 19.2–21.9°C, 8.8–9.1 mg O_2/L and pH 7.7–7.9). Daphnia unable to swim within 15 seconds of gentle agitation were considered to be immobile.

RESULTS

Concentration mg/L		*Number of D. magna*	*Number Immobilised*	
Nominal	*Actual*		*24 h*	*48 h*
0	Not reported	20	0	0
100	Not reported	20	0	0

EL50	>0.1 mg/L at 48 hours. Based on loading rates.
NOEL	0.1 mg/L at 48 hours. Based on loading rates.
Remarks - Results	There was no immobilisation in 20 daphnids exposed to the notified chemical at a nominal test concentration of 0.1 mg/L. There were no immobilised daphnids in the control group, and the dissolved oxygen in the control group and test vessels were ≥3 mg/L, thus validating the test. Deviation above the protocol temperature range (20 ± 1°C) was considered not to affect the validity or outcome of the test. An analytical method for the quantitative determination of soluble test material was reported to not be possible due to the insolubility of the notified chemical.
CONCLUSION	The notified chemical, up to the limit of its solubility, is not harmful to aquatic invertebrates.
TEST FACILITY	SafePharm Laboratories Ltd. (2007f)

C.2.3. Algal growth inhibition test

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 201 Alga, Growth Inhibition Test. EC Directive 92/69/EEC C.3 Algal Inhibition Test.
Species	*Desmodesmus subspicatus*
Exposure Period	72 hours
Concentration Range	Nominal: 0.10 mg/L
Auxiliary Solvent	None
Water Hardness	0.15 mmol Ca^{2+} & Mg^{2+}/L
Remarks - Method	After a range-finding test was conducted, a nominal concentration of 0.10 mg/L of the test substance was stirred in the test medium for 48 h, and undissolved test material was removed by a pre-conditioned filter (filtered WAF) to give a saturated solution. Algae, with a density of 4×10^3 cells per mL, were exposed to the filtered test medium and were irradiated constantly for 72 h (pH 7.0–8.0 and 24 ± 1°C). A negative control was maintained under the same conditions but not exposed to the test substance. The positive control was provided by potassium dichromate (0.0625–1.0 mg/L). A student's t-test incorporating Bartlett's test for homogeneity of variance was carried out on the data to determine any statistically significant differences between test and negative control groups.

RESULTS

Biomass		*Growth*	
E_bL_{50}	*NOEL*	*E_rL_{50}*	*NOEL*
mg/L at 72 h	*mg/L*	*mg/L at 72 h*	*mg/L*
>0.10	*0.10*	*>0.10*	*0.10*

Remarks - Results	There were no toxic effects to the algae at the saturation concentration of the notified chemical. Under the same conditions as for the test substance, the E_bL_{50} and E_rL_{50} values for the positive control compound were 0.20 mg/L (95% CI: 0.17–0.24 mg/L) and 0.58 mg/L (95% CI: 0.47–0.71) respectively. Cell growth of the negative control increased 39-fold after 72 h, thus validating the test. An analytical method for the quantitative determination of soluble test material was reported to not be possible due to the insolubility of the notified chemical.
CONCLUSION	The notified chemical, up to the limit of its solubility, is not harmful to

	algae.
TEST FACILITY	SafePharm Laboratories Ltd. (2007g)

C.2.4. Inhibition of microbial activity

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 209 Activated Sludge, Respiration Inhibition Test. EC Directive 88/302/EEC C.11 Biodegradation: Activated Sludge Respiration Inhibition Test
Inoculum	Activated sewage sludge from a municipal STP
Exposure Period	3 hours
Concentration Range	Nominal: 1000 mg/L
Remarks – Method	Following a range finding-test, the notified chemical was dispersed in the test medium (1000 mg/L) by ultrasonication for 15 minutes prior to the addition of synthetic sewage. Tests (in triplicate) were conducted by exposing activated sewage sludge to 1000 mg/L suspension of the test medium for a period of 3 h (21 ± 1°C and 1.7–8.5 mg O_2/L). Reference material (3,5–dichlorophenol), at concentrations of 3.2, 10, and 32 mg/L, was used to confirm the suitability of the inoculum. Statistical analyses were conducted using Wlfit software (IDBS) and Litchfield and Wilcoxon method.
RESULTS	
IC50	>1000 mg/L
NOEC	1000 mg/L
Remarks – Results	No significant inhibition was observed to microbial respiration at the nominal test concentration of 1000 mg/L. Variation in respiration rates of control after 3 h contact time was ± 0%, and the IC_{50} (3-hour contact time) for reference substance 3,5-dichlorophenol was 6.3 mg/L (95% CI: 4.9–8.2 mg/L), thus validating the test. Although some initial and final dissolved oxygen concentrations were below those recommended in the guidelines, and black particles of undissolved test material were observed in the test medium which were dispersed homogenously throughout the test media over the duration of the test, the outcome was not affected.
CONCLUSION	The notified chemical is not expected to be harmful to microbe respiration
TEST FACILITY	SafePharm Laboratories Ltd. (2007h)

BIBLIOGRAPHY

Nanjing Institute of Environmental Science, SEPA (2006) Evaluation of the NIR–IM1 on Ecological Environment Safety (Study No.: S2006NC015, 20 November 2006). Nanjing, China, Nanjing Institute of Environmental Science State Environmental Protection Administration, Fuji Xerox Co., Ltd. (Unpublished report provided by the notifier).

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

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

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

NTC (National Transport Commission) 2007 Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code), 7th Edition, Commonwealth of Australia

SafePharm Laboratories Ltd. (2006a) Notified chemical: Determination of General Physico-Chemical Properties. Final Report October 2006, SPL Project Number: 0681/0005 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2006b) Notified chemical: Acute oral toxicity in the rat – Acute Toxic Class Method. Final Report August 2006, SPL Project Number: 0681/0007 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2006c) Notified chemical: Acute dermal irritation in the rabbit. Final Report October 2006, SPL Project Number: 0681/0008 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2006d) Notified chemical: Acute eye irritation in the rabbit. Final Report August 2006, SPL Project Number: 0681/0009 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2006e) Notified chemical: Local lymph node assay in the mouse. Final Report August 2006, SPL Project Number: 0681/0010 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2006f) Notified chemical: Reverse mutation assay "Ames Test" using *Salmonella Typhimurium* and *Escherichia Coli*. Final Report September 2006, SPL Project Number: 0681/0013 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2007a) Notified chemical: Determination of Physico-Chemical Properties. Final Report July 2007, SPL Project Number: 0681/0028 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2007b) Notified chemical: Determination of Dissociation Constants in Water. Final Report August 2007, SPL Project Number: 0681/0028 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2007c) Notified chemical: Determination of Hazardous Physico-Chemical Properties. Final Report April 2007, SPL Project Number: 0681/0006 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2007d) Notified chemical: Twenty-eight days repeated dose oral (gavage) toxicity study in the rat. Final Report Feb 2007, SPL Project Number: 0681/0011 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2007e) Notified chemical: Chromosome aberration test in human lymphocytes *in vitro*. Final Report April 2007, SPL Project Number: 0681/0012 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2007f) Notified chemical: Acute Toxicity to *Daphnia magna.* Final Report April 2007, SPL Project Number: 0681/0014 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2007g) Notified chemical: Algal Growth Inhibition Test. Final Report July 2007, SPL Project Number: 0681/0015 for Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

SafePharm Laboratories Ltd. (2007h) Notified chemical: Assessment of the Inhibitory Effect on the Respiration of Activated Sewage Sludge. Final Report January 2007, SPL Project Number: 0681/0016, 30 January 2007 Fuji Xerox Co., Ltd., Minamiashigara-shi, Kanagawa-Ken, Japan. SafePharm Laboratories Ltd., Derby, UK (Unpublished report provided by the notifier).

Safety Assessment Headquarter (2007) Notified chemical: Acute dermal toxicity study in SD rats. Final Report October 2007, Study Number: TBH-887 (KG-2007-136) for Safe Chemicals, Seoul, Korea. Safety Assessment Headquarter, Korea Testing & Research Institute, Kyonggi-do, Korea (Unpublished report provided by the notifier).