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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

C-1805

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For Enquiries please contact Ms Karen Bell at:

Street Address: 92 Parramatta Rd Camperdown, NSW 2050, AUSTRALIA

Postal Address: GPO Box 58, Sydney 2001, AUSTRALIA

Telephone: (61) (02) 565-9466 **FAX (61) (02) 565-9465**

Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

C-1805

1. APPLICANT

Kodak Australasia Pty Ltd, 173 Elizabeth Street, Coburg, Victoria 3058.

2. IDENTITY OF THE CHEMICAL

Chemical name: C-1805

Molecular weight: 671.7

Based on the nature of the chemical and the data provided, C-1805 is not considered to be hazardous. therefore, the details relating to the chemical name, CAS number, molecular and structural formula and spectral data have been exempted from publication in the Full Public Report and the Summary Report

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa: bright red powder

Melting Point: decomposition occurs at 252°C

Specific Gravity/Density: not provided

Vapour Pressure: not provided

Water Solubility: not provided

Partition Co-efficient:
(n-octanol/water) not provided

Hydrolysis as a function of pH: not provided

Adsorption/Desorption: not provided

Dissociation Constant: not provided

Particle size distribution: not provided

The notifier states that preliminary solubility tests showed the chemical was too insoluble in water to allow measurement of a UV-VIS absorption spectrum. The spectrum was run using the chemical at a concentration of 10 mg.L⁻¹ and methanol as the solvent. From this it is inferred that the water solubility is much less than 10 mg.L⁻¹ (10 ppm).

Information was not provided on the remaining physico-chemical parameters on the grounds of negligible occupational and environmental exposure. The lack of an accurate water solubility precludes estimation of partition coefficient and adsorption/desorption values.

However, the Commonwealth Environmental Protection Agency (CEPA) calculated a log K_{OW} of at least 4.3, using the following equation;

$\log(1/S) = 1.339 \log K_{OW} - 0.978$; where S is in moles/L and the maximum solubility of 10 ppm is assumed.

A log K_{OW} of > 4.3 indicates C-1805 has high adsorption potential.

C-1805's relatively high molecular weight and salt form indicates it is unlikely to volatilise under environmental conditions.

Potential hydrolysis under environmental conditions is unclear.

4. PURITY OF THE CHEMICAL

Degree of purity: 100%

Toxic or hazardous impurities: none

Non-hazardous impurities: none

Additives/Adjuvants none

5. INDUSTRIAL USES

C-1805 is used in the manufacture of photographic film and paper. The chemical is approved in France in quantities < 1000 kg per year and is approved in the United States. It will be imported into Australia as the preweighed pure substance in quantities less than 50 kg per year for the next five years.

6. OCCUPATIONAL EXPOSURE

C-1805 will be weighed and added to a mixing tank. The resulting suspension will be chilled and stored. The suspension will be taken from storage and added to the photographic emulsion. The photographic emulsion will then be pumped to closely controlled automated processing equipment where C-1805 will be incorporated into articles.

Once the chemical becomes part of the article, there will be no potential exposure to the new chemical, as the chemical will be under overcoat layers.

Workers handling the dry chemical will handle it under extractor hoods and will wear protective clothing, safety glasses, surgical gloves and half face masks with particle filters. Workers handling mixes to which C-1805 has been added will wear protective clothing, safety glasses and surgical gloves.

7. PUBLIC EXPOSURE

Compound C-1805 is to be imported into Australia where it will be used within the confines of the importing company. The chemical is to be mixed into a dispersion which will be stored and later added to the photographic emulsions which will be incorporated into photographic film or paper under overcoat layers.

The concentration of C-1805 in the municipal sewer is likely to be 0.44 ppb. Additionally, less than 1% of the waste from the

production of photographic film or paper may be sent to secured landfills. Compound C-1805 is not classified as a Dangerous Good according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

Under the stated condition of use and release to the environment the potential for public exposure is low.

8. ENVIRONMENTAL EXPOSURE

8.1 Release

The company states there are no anticipated releases to the environment of the pure chemical. Less than 1% of the solution containing C-1805 could be released to the sewer. An additional 10% could be released from the automated processing equipment to the sewer. However, this waste is routed through the silver recovery plant and is likely to be absorbed to the removed solids from which silver (~10%) is recovered in Port Kembla and the remainder incinerated. The company is presently undertaking some analytical testing of the initial effluent, the recovered cake and the filtrate to confirm this. The municipal sewer flow is routed for secondary treatment at the Werribee treatment facility. Less than 1% of wastes may be sent to a secured landfill.

8.2 Fate

C-1805 will mainly enter the environment when waste from the automated processing equipment is discharged to the sewer. No biodegradation studies were provided by the notifier (these are not part of the small volume chemicals requirements). The biodegradation potential of C-1805 remains unclear. Three treatment systems are combined throughout the course of a year at the Werribee treatment complex, land filtration in summer and grass filtration and lagoon treatment in winter. Its most likely fate would appear to be sorption onto suspended solids and settling out over the land or into lagoon sludge, as sewage inflow passes through the filtration systems at Werribee.

8.3 Exposure Level

C-1805 has a low water solubility and may not be readily biodegraded. Therefore, it may bioaccumulate. However, the high molecular weight (671.7 g/mole) and relatively large molecular size may preclude this.

The possibility of soil accumulation needs consideration. Although C-1805 biodegradation potential may be low, accumulation in soils should not be significant due to the low level of exposure, as only ~5 kg C-1805 per annum is likely to find its way to Werribee.

9. EVALUATION OF TOXICOLOGICAL DATA

Under Section 23 of the *Industrial Chemicals (Notification and Assessment) Act, 1989*, there is no requirement to submit toxicological data on compounds to be imported in quantities of <1000 kg in any twelve month period. Acute toxicity has been carried out and reported:

9.1 Acute Toxicity

Test	Species	Outcome	Ref
Oral	rat	LD ₅₀ >5000mg/kg	(5)
Dermal	rat	LD ₅₀ >2000mg/kg	(7)
Skin irritation	rabbit	non-irritating	(9)
Eye irritation	rabbit	slightly irritating	(11)
Skin sensitisation	guinea pig	non-sensitising	(13)

9.1.1 Oral Toxicity (5) OECD Test Guideline #401(6)

Five male and five female CD^R (SD) BR rats received a single dose of 5000mg/kg C 1805 as a 25% suspension in corn oil. Animals were observed three times on the day of dosing and then daily until 14 days after dosing.

No deaths occurred. The only clinical sign reported was red diarrhoea in 2 males and 1 female on the day of dosing and red discoloured faeces in all animals on days 1 and 2. All animals gained weight. No treatment related abnormalities were found at necropsy.

The oral LD₅₀ of C-1805 in the rat was found to be >5000 mg/kg.

9.1.2 Dermal Toxicity (7) OECD Test Guideline #402 (8)

A dose of 2000mg/kg C-1805 was applied to a fibre pad and placed on the clipped back of each of five male and five female CD^R (SD) BR rats. The test substance was moistened with distilled water. Animals were observed daily for 14 days.

No clinical signs of toxicity were observed, animals gained weight normally and no treatment related findings were reported at necropsy. The notified chemical stained the skin of all animals pink. Staining persisted up until day 8 in all animals and until the end of the study in some and would thus have precluded any observation of erythema due to skin irritation.

The dermal LD₅₀ was found to be >2000 mg/kg.

9.1.3 Skin Irritation (9) OECD Test Guideline #404 (10)

A single dose of 0.5 g C-1805, moistened with water, on a fibre pad was applied to the clipped back of each of three New Zealand White rabbits and held in place by an occlusive wrap for four hours before removal with running water and acetone. The application site was examined 1,24,48 and 72 hours and 7 and 14 days after removal.

Slight staining of the site was seen on removal of the material and may have masked any erythema due to irritation of the skin. This staining persisted for 48 hours in one animal and until day 7 in two animals. No irritation was seen at the margins of the site and no oedema was reported. Animals gained weight normally and no toxic effects were observed.

C-1805 was found to be non-irritating to the skin in this test.

9.1.4 Eye Irritation (11) OECD Test Guideline(12)

Six New Zealand White rabbits received single doses of 0.1 g C-1805 in powder form into the left eye. The material was washed from the eye of three animals immediately with running distilled water and allowed to remain in the eyes of the remaining three animals. Eyes were observed immediately and at one, 24, 48 and 72 hours after administration. Fluorescein examination was done at 24 hours.

Unwashed eyes were stained by the red powder, C-1805, at one hour after administration and erythema could not be assessed. No oedema was noted at one hour but, at 24 hours, slight oedema of the adnexa was reported in one rabbit. At 24 hours, slight-moderate erythema was reported; corneal opacity and fluorescein staining did not occur. Eyes were normal at 72 hours in 2/3 animals. Immediate washing was palliative, slight erythema was noted immediately after washing, All washed eyes appeared normal at 24 hours.

C-1805 was found to be mildly irritating to the eye.

9.1.5 Skin Sensitisation (13) OECD Test Guideline #406(14)

The skin sensitisation potential of C-1805 was determined in guinea pigs of the GP(HA)Br Hartley strain. A preliminary experiment assessed the maximum non-irritant concentration of C-1805 at 24 and 48 hours, and found that the 100% powder was non irritating to the skin.

Induction was carried out by application of 100% C-1805 to the clipped backs of 5 male and 5 female guinea pigs, under an occlusive dressing for six hours, excess material was wiped off. The procedure was repeated weekly for three weeks. Two weeks after the last induction treatment, 100% C-1805 was applied to the back of these animals on the opposite side from the side used for induction. An additional group of 5 male and 5 female guinea pigs which had not been previously treated were challenged by a similar technique.

The report did not comment on any staining after application of the red powder. However, at 24 and 48 hours, there was no reddening of the application site in any animals of the test group or the control group. No toxic effects were reported.

C-1805 was concluded not to be a skin sensitiser in this study.

9.4 Overall Assessment of Toxicological Data

C-1805 has low toxicity by the oral and dermal routes of administration. It is non-irritant to the skin and slightly irritating to the eye. It may be regarded as having the potential to be slightly irritating to the respiratory tract. C-1805 was not found to be a skin sensitiser.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

Under Section 23 of the *Industrial Chemicals (Notification and Assessment) Act, 1989*, there is no requirement to submit ecotoxicological data on compounds to be imported in quantities of <1000 kg in any twelve month period.

11. ASSESSMENT OF ENVIRONMENTAL HAZARDS

It should be noted that C-1805 will be a minor component of a number of new chemicals that will be used during the one product run, resulting in Kodak releasing approximately a total of 3.6 tonne of new chemical substances per annum to the sewer. Discussions with the company as well as Melbourne Water, including a site visit, has indicated that the company has initiated an active program aimed at identifying and reducing the amount of these discharged chemicals. This includes a renegotiation with Melbourne Water of the amount of treated effluent allowed to be discharged.

The usage of C-1805 is < 50 kg per annum. In a worst case situation, approximately 220 g goes to the sewer per batch. This will be diluted into 500 megalitre at Werribee, giving a concentration of ~0.44 ppb. Further dilution (of between 1:5 and 1:25) will occur when water is discharged into the receiving waters in a 1 km mixing zone around the outlets, leading to a worst case concentration of 0.09 ppb.

This calculation assumes there will be no losses due to adsorption to sediment etc. In line with the notifications of similar chemicals the substance is likely to remain with the Werribee sewerage complex, either in solution, adsorbed to either sediments

or soil, and the expected exposure to natural organisms and bioaccumulation is likely to be low. Therefore, C-1805 is likely to present a low hazard to the environment.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY

The most likely route of worker exposure is by skin or eye contact with the C-1805 in powder form. The chemical is slightly irritating to the eye and would be expected to be a slight respiratory irritant. No data are available on particle size. As C-1805 has some eye irritant properties, eye protection is required. All precautions should be taken against the formation of dusts and (for liquid products) mists or aerosols. Engineering measures to decrease airborne contamination and protective clothing and respiratory protection will be recommended.

The potential for public exposure under normal use conditions is low. Exposure through the municipal sewers and secured landfills is anticipated to be negligible.

13. RECOMMENDATIONS

The following guidelines and precautions should be observed when using C-1805 and/or products containing it.

- . Workers handling C-1805 and products containing it should use good housekeeping procedures and minimise the formation of dusts containing the chemical and avoid splashing solutions containing the chemical.
- . Local exhaust ventilation should be used in areas when C-1805 and products containing it are in use.
- . Workers handling C-1805 powder should wear protective clothing conforming to Australian Standard (AS) 3765.1-1990 (15), safety glasses conforming to AS 1337-1984 (16), disposable gloves conforming to AS 2161-1978 (17) and half masks with particle filters conforming to AS 1715-1991(18) if local exhaust ventilation is inadequate.
- . Workers handling non-powder products containing C-1805 should wear protective clothing conforming to AS 3765.1-

1990, safety glasses conforming to AS 1337-1984 and disposable gloves conforming to AS 2161-1978.

- . C-1805 should be stored apart from oxidisers.
- . Spills should be swept up and packaged for incineration or for disposal by a licensed chemical waste disposal agent.
- . If the material does enter the eye, it should be washed out immediately and the eye irrigated for 10 minutes.
- . The company, in conjunction with Melbourne Water, should continue to look at ways of minimising the amount of these chemicals discharged to the sewer.

14. MATERIAL SAFETY DATA SHEET(S)

Attached to this Full Public Report is a Material Safety Data Sheet (MSDS) for C-1805. The MSDS was provided in Worksafe Australia format (19) by Kodak Australasia Pty Ltd as part of their notification statement. It is reproduced here as a matter of public record. However, the accuracy of this information remains the responsibility of Kodak Australasia Pty Ltd.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act), secondary notification of C-1805 shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. When the level of importation rises above 1 tonne, Kodak should provide accurate water solubility and partition coefficient values for C-1805. No other specific conditions are prescribed.

16. REFERENCES

- (1) Lyman, W J (et al). Handbook of Chemical Property Estimation Methods, McGraw-Hill, (1982) p2-34.
- (2) Wild S R & Jones K C. Organic chemicals entering agricultural soils in sewage sludges: screening for their potential to transfer to crop plants and livestock, The Science of the Total Environment, 119 (1992), p85-119.
- (3) Australian Sewage Profile. (1988), DASET internal report.
- (4) Connell D W, (1990). Bioaccumulation of Xenobiotic Compounds, CRC Press, p56.
- (5) Acute Oral Toxicity of C-1805. TX-89-290. Data on File, Eastman Kodak Company, Rochester N.Y USA.
- (6) OECD Guidelines for Testing of Chemicals # 401 Acute Oral Toxicity.
- (7) Acute Dermal Toxicity of C1805. TX-89-291. Data on File, Eastman Kodak Company, Rochester, N.Y. U.S.A.
- (8) OECD Guidelines for Testing of Chemicals # 402 Acute Dermal Toxicity.
- (9) Acute Dermal Irritation of C-1805. TX-89-292. Data on File, Eastman Kodak Company, Rochester, N.Y. U.S.A.
- (10) OECD Guidelines for Testing of Chemicals # 404 Acute Dermal Irritation/Corrosion.
- (11) Acute Eye Irritation of C-1805. TX-89-294. Data on File, Eastman Kodak Company Rochester, N.Y. U.S.A.

- (12) OECD Guidelines for Testing of Chemicals # 405 Acute Eye Irritation/Corrosion.
- (13) Skin Sensitisation Study(Buehler Method) of C-1805. TX-89-293. Data on File, Eastman Kodak Company, Rochester, N.Y. U.S.A.
- (14) OECD Guidelines for Testing of Chemicals # 406 Skin Sensitisation.
- (15) Australian Standard 3765.1-1990. Clothing for Protection against Hazardous Chemicals Part 1 Protection against General or Specific Chemicals Standards Association of Australia Publ, Sydney 1990.
- (16) Australian Standard 1337-1984. Eye Protectors for Industrial Applications, Standards Association of Australia Publ, Sydney 1984.
- (17) Australian Standard 2161-1978. Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves), Standards Association of Australia Publ, Sydney 1978.
- (18) Australian Standard 1715- 1991. Selection, use and maintenance of Respiratory Protective Devices, Standards Association of Australia Publ, Sydney 1991.
- (19) Guidance Note for Completion of a Material Safety Data Sheet. [NOHSC : 3001 (1991)], 3rd Edition, October 1991.