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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**C-1721**

This Assessment has been compiled in accordance with the provisions of *the Industrial Chemicals (Notification and Assessment) Act 1989, as amended* and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by Worksafe Australia which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment, Sport, and Territories and the assessment of public health is conducted by the Department of Health, Housing, Local Government and Community Services.

For the purposes of subsection 78(1) of the Act, copies of this full public report may be inspected by the public at the Library, Worksafe Australia, 92-94 Parramatta Road, Camperdown NSW 2050, between the hours of 10.00 a.m. and 12.00 noon and 2.00 p.m. and 4.00 p.m. each week day except on public holidays.

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Director
Chemicals Notification and Assessment

**FULL PUBLIC REPORT**

**C-1721**

## 1. APPLICANT

Kodak Australasia Pty Ltd, 173 Elizabeth St, Coburg, Victoria

## 2. IDENTITY OF THE CHEMICAL

Based on the nature of the chemical and the data provided,C-1721, is considered to be non-hazardous. Therefore, the chemical Name, CAS No., molecular and structural formulae, spectral data and specific use have been exempted from publication in the Full Public Report and the Summary Report.

**Chemical name:** C-1721

**Molecular weight:** 226.35

**Method of detection and determination:**

Separation by High Performance Liquid Chromatography with UV detection

## 3. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance at 20°C and 101.3 kPa:** white, crystalline solid

**Melting Point:** >300°C

**Density:** 1,480 kg/$m^3$

**Water Solubility:** 187 g/L at 25°C

**Partition Coefficient (n-octanol/water)** log $P_{O/W}$: -2.73

| | |
|---|---|
| **Hydrolysis as a function of pH:** | No evidence of hydrolysis over 5 days at three pH levels (4, 7 and 9) at 50°C |
| **Adsorption to Soil:** | Measured as 13.3% to Spodosol, 1.36% to Alfisol and -1.45% to Entisol. Desorption not performed as adsorption was <25% |
| **Dissociation Constant** pKa: | completely dissociates |
| **Decomposition Products:** | expected to be carbon dioxide, carbon monoxide, oxides of sulfur and hydrogen sulfide |
| **Flammability:** | the notified chemical is combustible but non-flammable |
| **Explosive Properties:** | not expected on the basis of chemical structure |
| **Reactivity/Stability:** | stable, incompatible with strong oxidisers |
| **Particle size distribution:** | range - 38 - >2360µm<br>mean - 343 µm |

**Comments on Physico-chemical Properties**

C-1721's relatively high molecular weight and salt form indicate it is unlikely to volatilise under environmental conditions.

The soil adsorption/ desorption study was conducted on three soils: loamy sand (pH 4.7, %OC 2.4), silt loam (pH 6.5, %OC 3.0) and a loam (pH 7.5, %OC 1.2). The results indicating poor adsorption are tabled below:

| Soil Type | % adsorbed test article | Koc |
|---|---|---|
| Loamy sand | 13.3 | 36.56 |
| Silt loam | 1.3 | 2.67 |
| Loam | -1.45 | -6.63 |

The study for the pKa determination of C-1721 noted that the sample solutions became cloudy with time. Apparently there is some degradation of the sample occurring. Solutions were titrated but no endpoints were found. It is noted C-1721 is likely to dissociate to give metal ions and an anionic acid which is likely to have strong acidity.

## 4. PURITY OF THE CHEMICAL

**Degree of purity:** >99%

**Toxic or hazardous impurities:** None

**Non-hazardous impurities:** None

**Additives/Adjuvants:** None

## 5. INDUSTRIAL USE

The notified chemical will be imported for use in the manufacture of photographic film or paper at a rate of <100 kg/yr.

## 6. OCCUPATIONAL EXPOSURE

Six workers will weigh out the dry chemical up to 30 times per year in 3 kg amounts into a mix tank containing water. The resulting dilute solution will be stored in closed plastic bottles for about 2 weeks and added to a photographic solution as required. Fifteen workers will be involved in stirring the notified chemical into the photographic solution. This solution is pumped to closely controlled automated processing equipment where the notified chemical will be incorporated into articles.

Weighing out will be conducted in a mechanically ventilated hood and addition to the mix tank will be conducted using air extractors with mechanical ventilation close to the mix tank.

## 7. PUBLIC EXPOSURE

There is low potential for public exposure to the notified chemical during shipment and distribution.

The public should have minimal exposure to C-1721 due to the expected low concentrations in sewerage and the fact that, once incorporated into articles, the chemical will be under overcoat layers.

## 8. ENVIRONMENTAL EXPOSURE

### . Release

There are no anticipated releases to the environment of the pure chemical. Less than 1% of the photographic solution containing the new chemical could be released to the municipal sewer. An additional 10% could be released from the automated processing equipment to the municipal sewer. A maximum of 11 kg per annum of C-1721 is likely to find its way to Werribee.

The municipal sewer flow is routed for secondary treatment to the Werribee Treatment Facility, operated by Melbourne and Metropolitan Board of Works. The discharge rate of this facility is approximately 500 ML per day. The dilution ratio of discharge into the receiving body of water in a 1 km mixing zone around the outlets is estimated to be between 1:5 and 1:25. No estimates are available for further dilution beyond the 1 km mixing zone.

Additionally, less than 1% of wastes may be sent to landfill.

### . Fate

C-1721 will mainly enter the environment when waste from the automated processing equipment is discharged to the sewer and find its way to Werribee.

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 ["Australian Sewage Profile", (1988), DASET internal report]. Its most likely fate would appear to be dissociation in water. Due to the high water solubility and poor adsorption characteristics these are likely to remain in solution.

No biodegradation studies were provided by the notifier (these are not part of the small volume chemicals requirements). However, biodegradation is likely to occur under the conditions at Werribee on the basis that a similar compound has been stated as being easily degradable (1).

C-1721 is unlikely to bioaccumulate due to its high water solubility and low partition coefficient.

## 9. EVALUATION OF TOXICOLOGICAL DATA

Toxicological data are not required under the *Industrial Chemicals (Notification and Assessment) Act, 1989, as amended* for chemicals imported in amounts of <1 tonne per year. However, for C-1721, data on acute oral toxicity, skin and eye irritation were included in the submission.

### 9.1 Acute Toxicity

Table 1 Summary of the acute toxicity of C-1721

| Test | Species | Outcome | Reference |
|---|---|---|---|
| Acute oral toxicity | Rat | $LD_{50}$ >2000 mg/kg | (2) |
| Skin irritation | Rabbit | Not irritant | (3) |
| Eye irritation | Rabbit | Moderate irritant | (4) |

#### 9.1.1 Oral Toxicity (Ref No:2)

A limit test was performed using a 20% formulation of the notified chemical in a 0.5% aqueous suspension of guar gum.

A single dose of the notified chemical at 2000 mg/kg was administered to 5 male and 5 female CD(SD)BR VAF/Plus rats by gavage. All animals were killed at the termination of the study after a 14 day observation period.

Abnormal clinical signs noted on the day of dosing included slight weakness for all animals and diarrhea for 2 of 5 males and 4 of 5 females.

No animals died during the study and no abnormalities were noted during gross necropsy examination.

It is concluded that the acute oral $LD_{50}$ of the notified chemical is >2000 mg/kg.

### 9.1.2 Skin Irritation (Ref No:3)

The notified chemical, thoroughly moistened with water, was evaluated for potential as a primary skin irritant using 3 New Zealand white rabbits. Each rabbit was administered 0.5 g of the test article topically to one intact test site. Immediately following dose administration, each test site was covered with a fibre pad and an occlusive wrap. The cuff was removed 4 hours after dose administration and the sites rinsed with running water.

Test sites were scored 1, 24, 48 and 72 hours post-treatment. No signs of irritation or abnormal clinical signs were observed at any time during the study. All animals survived the 72 hour observation period.

### 9.1.3 Eye Irritation (Ref No:4)

An eye irritation study was conducted with the notified chemical using 6 New Zealand white rabbits. After administration of a single dose of 0.1 gram of the notified chemical into the conjunctival sac of one eye of each animal, three of the six treated eyes were washed with distilled water. The eyes of the remaining three animals were not irrigated.

For the unwashed eyes, at one hour post-treatment, all rabbits exhibited moderate erythema of the conjunctivae and slight oedema. At 24, 48 and 72 hours post-treatment, moderate (1/3) to strong (2/3) erythema of the conjunctivae was observed. Either no oedema (1/3), slight oedema (1/3) or moderate oedema (1/3) at

48 and 72 hours and slight oedema at 24 hours was observed. Effects on corneal opacity were observed in one rabbit and these were slight (24 and 72 hours) to moderate (48 hours). Slight injection of the irides was observed in two rabbits although in one of these the iris was normal at 72 hours.

Immediate irrigation of the eyes was palliative.

The results of this study indicate that the notified chemical should be considered a moderate eye irritant.

### 9.4 Overall Assessment of Toxicological Data

The notified chemical was of low acute oral toxicity in rats, was not irritating to rabbit skin but was found to be a moderate eye irritant in rabbits.

## 10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No environmental effect studies were submitted and these are not required for a chemical to be introduced at < 1 tonne per year.

## 11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The usage of C-1721 is 100 kg per annum. For one batch of photographic solution, approximately 200 g of chemical is used. If 11% (22 g) goes to the sewer this will be diluted into 500 ML at Werribee, giving a concentration of ~0.04 ppb. Further dilution (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.

This calculation assumes there will be no losses due to adsorption to sediment etc. C-1721 is likely to biodegrade under conditions at Werribee and expected exposure to natural organisms and bioaccumulation is likely to be low. Therefore, C-1721 is likely to present a low hazard to the environment.

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

Exposure to the notified chemical in powder form is not expected to be significant on the basis of the time taken to weigh out a

small amount of chemical (3 kg), a limited number of times per year, and the fact that local exhaust ventilation is employed during weighing operations. The notified chemical is expected to be an eye irritant on the basis of a study in rabbits so that work practices should be employed to prevent the powder contacting the eye.

The MSDS for the notified chemical states that temperatures above 70°C should be avoided due to the possibility of explosion of the organic powder.

There is low potential for public exposure to the notified chemical and, therefore, minimal risk of public health or safety effects.

## 13. RECOMMENDATIONS

To minimise occupational exposure (and public/environmental if recommendations have been made by these agencies) to C-1721 the following guidelines and precautions should be observed:

- if engineering controls and work practices are insufficient to significantly reduce exposure to C-1721 to a safe level, then personal protective devices which conform to and are used in accordance with Australian Standards (AS) for eye protection (AS 1336; AS 1337) (5,6), impermeable gloves (AS 2161) (7) and protective clothing (AS 3765.1, 3765.2) (8,9) should be worn;

- good housekeeping and maintenance should be practised. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal in accordance with local or State regulations;

- storage of the powder should be in robust sealed containers away from sources of ignition, hot surfaces or high temperatures (>70°C). Keep from contact with oxidising materials. Electrical fittings, machinery and equipment should be earthed and dust proof;

- the workplace should be well ventilated;

- good personal hygiene should be observed; and

. a copy of the Material Safety Data Sheet should be easily accessible to employees.

## 14. MATERIAL SAFETY DATA SHEET

The Material Safety Data Sheet (MSDS) for C-1721 (Attachment 1) was provided in Worksafe Australia format (10). This MSDS was provided by Kodak Australasia Pty Ltd as part of their notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of Kodak Australasia Pty Ltd.

## 15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act), secondary notification of C-1721 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. *Structure-Activity Relationships for Biodegradation*, Draft OECD Environment Monograph No. 68, p. 98.

2. *C-1721, Acute Oral Toxicity Study in the Rat*, Data on file, Eastman Kodak Company, Rochester, New York, USA, Project No. 92-0012, 1992.

3. *C-1721, Acute Dermal Irritation Study in the Rabbit*, Data on file, Eastman Kodak Company, Rochester, New York, USA, Project No. 92-0012, 1992.

4. *C-1721, Acute Eye Irritation Study in the Rabbit*, Data on file, Eastman Kodak Company, Rochester, New York, USA, Project No. 92-0012, 1992.

5. Australian Standard 1336-1982, *Recommended Practices for Eye Protection in the Industrial Environment*, Standards Association of Australia Publ., Sydney, 1982.

6. Australian Standard 1337-1984, *Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney, 1984.

7. Australian Standard 2161-1978, *Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standards Association of Australia Publ., Sydney, 1978.

8. 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.

9. Australian Standard 3765.2-1990, *Clothing for Protection Against Hazardous Chemicals, Part 2: Limited Protection Against Specific Chemicals*, Standards Association of Australia Publ., Sydney, 1990.

10. National Occupational Health and Safety Commission, *Guidance Note for the Completion of a Material Safety Data Sheet*, 2nd. edition, AGPS, Canberra, 1990.