

File No PLC/897

January 2010

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME
(NICNAS)**

FULL PUBLIC REPORT

Polymer in KT-1

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:

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**Director
NICNAS**

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FULL PUBLIC REPORT**Polymer in KT-1****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Kao (Australia) Marketing Pty Ltd (ABN: 59 054 708 299)
1-5 Commercial Rd, KINGSGROVE NSW 2208

NOTIFICATION CATEGORY

Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers, Use Details, Import Volume

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)

None

NOTIFICATION IN OTHER COUNTRIES

USA

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

KT-1

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) > 1,000 Da

REACTIVE FUNCTIONAL GROUPS

The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION*Criterion*

Molecular Weight Requirements
Functional Group Equivalent Weight (FGEW) Requirements
Low Charge Density
Approved Elements Only
Stable Under Normal Conditions of Use
Not Water Absorbing
Not a Hazard Substance or Dangerous Good

Criterion met

Yes
Yes
Yes
Yes
Yes
Yes
Yes

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	Pale yellow powder	
Glass Transition Temp	60°C	
Density	1200 kg/m ³ at 20°C	
Water Solubility	Not determined. Expected to be low based on the predominately hydrophobic chemical structure of the polymer.	
Dissociation Constant	Not determined. The notified polymer contains carboxylic acid functionality and may be ionised under normal environmental conditions.	
Particle Size	Particle size (µm)	% in range by weight
	> 1000	1.99
	1000-850	2.53
	850-500	19.5
	355-500	19.29
	250-355	21.02
	150-250	19.67
	< 150	16.0
Reactivity	The notified polymer contains functional groups that may be slowly hydrolysed in the environment.	
Degradation Products	None under normal conditions of use	

5. INTRODUCTION AND USE INFORMATION

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

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

Use

The notified polymer will be used as a colour pigment in ink toner cartridges (< 10%) and in developers at < 1% for use in printers (including industrial printing machines) and photocopy machines. The toner cartridges and developer bottles will be supplied to office equipment suppliers for retail sale.

The toner cartridges will be inserted inside printing equipment, whilst the developer will be injected from the bottles into the equipment through dedicated inlets.

Mode of Introduction and Disposal

The notified polymer will be imported as a component of sealed toner cartridges (300-3000g capacity) at concentrations < 10% and as a component of developer in 1 L plastic bottles at concentrations < 1%.

6. HUMAN HEALTH IMPLICATIONS

Hazard Characterisation

No toxicological data were submitted. The notified polymer meets the PLC criteria and is therefore assumed to be of low hazard.

Occupational Health and Safety Risk Assessment

The developer containing the notified polymer will be fed directly into the printer or photocopy machine through a dedicated inlet. Dermal exposure from spills may occur but is not considered to be significant due to the low concentration of the notified polymer (< 1%) in the developer.

Dermal exposure of office workers and service technicians to the notified polymer may occur when replacing spent toner cartridges and clearing paper jams from the printer or photocopier. However, the design of the cartridges is such that release of the notified polymer is not expected to occur during normal use. Once the ink dries, the notified polymer will be trapped on the printed paper, and further dermal exposure from contact with the dried ink is not expected.

Comment [J1]: Exposure description should be incorporated in the risk assessment

Overall, the OHS risk presented by the notified polymer is not considered to be unacceptable, based on the minimal exposure to workers and the assumed low hazard of the polymer.

Public Health Risk Assessment

The scenarios by which the public may be exposed to the notified polymer would involve home use of printers and photocopiers, and are similar to those for office workers. However, it is expected that the public will be using the printer and photocopier less often than workers.

The risk to public health presented by the notified polymer is not considered to be unacceptable due to its assumed low toxicity, low concentration in cartridges/developers and low potential for exposure.

7. ENVIRONMENTAL IMPLICATIONS

Hazard Characterisation

No ecotoxicological data were submitted. Some classes of anionic polymers are moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This does not apply to the notified polymer and it is not expected to be a toxic hazard to algae.

Environmental Risk Assessment

The widespread use pattern indicates that landfills would receive the notified polymer bound into the toner matrix within cartridges (< 5%) and on paper products. During printing the notified polymer will interact with other components to form a stable polymer matrix and is expected to be immobile. During recycling processes waste paper is repulped using a variety of chemical agents, which, amongst other things, enhance toner detachment from the fibres. The aqueous wastes go to the sewer. Very little of the notified polymer is expected to partition to the supernatant water, due to its predominantly hydrophobic nature, which is released to the sewer. Sludge generated during the washing process is dried and thermally decomposed or sent to landfill for disposal. The notified polymer is expected to neither become dispersed in the environment when it is used as proposed, nor cross biological membranes, because of its molecular weight, and its entrapment in the toner matrix. The lack of a significant aquatic exposure pathway and the presumed low environmental toxicity together indicate minimal risk to the environment from the notified polymer when it is used in photocopier toners and developers.

Comment [J2]: Environmental Release and Fate to be incorporated in this section

8. CONCLUSIONS AND RECOMMENDATIONS

Human health risk assessment

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

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

Environmental risk assessment

Based on the reported use pattern, the notified polymer is not expected to pose a risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- No specific engineering controls, work practices or personal protective equipment are required for the safe use of the notified polymer itself, however, these should be selected on the basis of all ingredients in the formulation.

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

- A copy of the MSDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer 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.

Environment

- Do not allow material or contaminated packaging to enter drains, sewers, or water courses.

Disposal

- The notified polymer should be disposed of in landfill.

Emergency procedures

- Spills and/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 polymer 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 polymer, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer 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 notified polymer is introduced in a chemical form that does not meet the PLC criteria.or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the notified polymer has changed from a component of toner and developer, or is likely to change significantly;
 - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
 - the notified polymer 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.

Comment [s3]: Use for imported chemicals. Delete if the chemical is already manufactured in Australia

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 polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.