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

FULL PUBLIC REPORT

Polymer in Sokrat 1691

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT

Polymer in Sokrat 1691

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Eastman Chemical Limited (ABN: 72 001 313 417)

Level 9, 123 Epping Road

NORTH RYDE NSW 2113

NOTIFICATION CATEGORY

Synthetic Polymer of Low Concern

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

Polymer constituents

Number Average Molecular Weight

Weight Average Molecular Weight

Weight Percentage of polymer species with MW<1000 and MW<500

Charge Density

Polymer Constituents

Residual Monomers and Impurities

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

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in Sokrat 1691

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
Meets Molecular Weight Requirements	Yes
Meets Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Not Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Not a Hazardous Substance or Dangerous Good	Yes

The notified polymer contains a high concern Reactive Functional Group (FGEW=1870) but the criteria for FGEW requirements is met due to its high molecular weight (>10000).

4. INTRODUCTION AND USE INFORMATION

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

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	150	150	150	150	150

USE

The notified polymer will be used as component of a coating for textiles. It will not be manufactured or reformulated in Australia. The notified polymer will be imported in an aqueous emulsion at a concentration of approximately 50%.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

Formulation of Coating

During coating formulation, the imported emulsion is pumped into enclosed mixing vessel, where the polymer emulsion is added to the other ingredients to form the coating. Sampling and quality testing is carried out prior to packaging. When the batch meets specifications, the coating is drummed off for distribution to customers. The coating products are formulated in batch sizes of up to 10 tonnes. Two products will be formulated; the concentration of the notified polymer in these products will be 17% and 34%.

End use of Coating

The coating is transferred to a hopper of the coating machine. The coating is applied to rolls of textile of standard size, via a roller which picks up from a reservoir within the coating machine and applies it in a continuous process. The coating is cured in a drying oven and collected on a roller. The coating machines are washed between coating runs.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

Little environmental exposure of the notified polymer is anticipated during the formulation of the coating products. Waste polymer from drips and spills at the reformulation plant (<1% of import volume) and washing of equipment may finally end up in the sewer following on site treatment. Empty import containers containing residues of up to 1% of the notified polymer will be collected by licensed contractors for recycling. These residues will find their way into the facility's onsite treatment plant in washings from the drums, where the polymer is likely to become associated with the sediment and be disposed of to landfill.

Losses at the application site are estimated to be up to 0.54% of the import volume arising from spills and water washes of the coating machines. The wastewater is expected to be released to sewer via an onsite treatment plant.

Fabrics coated with coatings containing the notified polymer are likely to end up in landfill at the end of their useful lifetimes. The low water solubility of the polymer would indicate that the notified polymer is not likely to be mobile and will associate with soils and sediment.

6.2. Summary of Occupational Exposure

Dermal and ocular exposure can occur during certain formulation processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

6.3. Summary of Public Exposure

The notified polymer will not be available to the public. Members of the public may come into contact with finished coated textiles containing the notified polymer.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	White milky emulsion
Boiling Point	100°C (emulsion)
Density	1085 kg/m ³ (emulsion)
Water Solubility	Stated as insoluble on the basis of the particle size of the polymer. However, the polymer is imported as an emulsion in water.
Reactivity	Stable under normal environmental conditions
Degradation Products	Incineration of the polymer would result in its destruction with the liberation of oxide of carbon oxygen and nitrogen.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

The following toxicological studies were submitted for the emulsion Sokrat 1691.

<i>Endpoint</i>	<i>Result</i>	<i>Classified?</i>	<i>Effects Observed?</i>
1. Rat, acute oral	LD50 >20000 mg/kg bw	no	no
2. Rat, acute dermal	LD50 >5000 mg/kg bw	no	no
3. Rabbit, skin irritation	slightly irritating	no	yes
4. Rabbit, eye irritation	non-irritating	no	yes

8.1.1 Discussion of Observed Effects

Skin irritation: Slight oedema and erythema was observed after 24 hours. Slight erythema and very slight oedema was discovered after 48 hours. At 72 hours, very slight erythema and slight oedema was observed. Inflammation persisted in two of the animal at the end of 72 hours. It is likely that the observed irritation is due to constituents of the emulsion other than the notified polymer.

Eye irritation: A very weak discharge of mucous and pus and a very slight congestion of conjunctival sac was observed after one hour. No effects were observed at 24, 48, and 72 hours.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. The results of the toxicological studies undertaken using the emulsion Sokrat 1691 indicates the notified polymer was of low acute oral toxicity. Slight skin irritation was observed, however it is possible that the skin response is due to the other components of the emulsion. Irritation of the eye was observed at one hour following application of the emulsion to the eyes of rabbits, no effects were observed at 24, 48 and 72 hours.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

The following summaries of toxicological studies were submitted:

<i>Endpoint</i>	<i>Result and Conclusion</i>
Fish Toxicity	EC50 >100 mg/L
Daphnia Toxicity	EC50 = 72.30 ± 25.50 mg/L
Algal Toxicity	EC50 >100 mg/L
Inhibition of Root Growth	9% inhibition at 100 mg/L

9.1.1 Discussion of Observed Effects

The details provided for the toxicity studies were limited. No indication of the preparation of the test material was given in the summary provided.

The toxicity to fish was examined as a limit test using a semi static method with *Poecillia reticulata* as the test organism and was conducted over a 96 h period at a temperature of 22±1°C. A limit test was also conducted for the algae *Scenedesmus subspicatus* for an exposure period of 72 h at 23±2°C. No toxicity was observed in either that fish or algae study.

The daphnia study was conducted for *Daphnia magna* over a range of concentrations between 0-150 mg/L at a temperature of 21±1°C. The lowest observed effect concentration (LOEC) was 50 mg/L, with 100% mortality at 90 mg/L.

The root growth inhibition test provided is an unusual one and was conducted on *Sinapsus alba*. Seeds were exposed to 10 mL of 100 mg/L on a Petri dish on the dark for a period of 72 h. The length of growth of the roots on treated seeds was compared with controls.

9.2. Environmental Hazard Assessment

The results for fish and algae were indicative of low toxicity. The results for daphnia indicate that the polymer is slightly toxic to this organism. The polymer showed slight inhibition of the root growth of *Sinapsus alba* at a loading of 100 mg/L.

10. RISK ASSESSMENT

10.1. Environment

Use of the notified polymer in fabric coatings for curtains is expected to result in limited environmental exposure. The majority of the polymer will share the fate of the material to which it is bonded and either be disposed of to landfill or incinerated. In landfill, the polymer is not expected to be mobile, as it will remain within the cured coating matrix. Incineration of the polymer would result in its destruction with the liberation of oxide of carbon oxygen and nitrogen.

It is not possible to determine a meaningful predicted environmental concentration (PEC) value in order to assess the risk to aquatic organisms, as the use pattern of the notified polymer will result in limited exposure to the aquatic environment. The available ecotoxicity data indicate that the polymer is of low to slight toxicity to aquatic organisms. Hence, due to the limited release to water, it is unlikely that the polymer would exist at levels which could pose a threat to aquatic organisms. The high molecular weight indicates a low potential for bioaccumulation. Based on the proposed use pattern, the risk of the notified polymer to the environment is expected to be low.

10.2. Occupational health and safety

The OHS risk presented by the notified polymer, by itself, is expected to be low. The notified polymer may be present in formulations containing hazardous ingredients. If these formulations are classified as hazardous to health in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

10.3. Public health

The notified polymer will not be available to the public. Members of the public may make dermal contact with products containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is bound within a matrix and unlikely to be bioavailable.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.2. Environmental risk assessment

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

10.3. Human health risk assessment

10.3.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

10.3.2. Public health

There is Low Concern to public health when used as described in the submission.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The notifier has provided MSDS in accordance with the schedule item B 12 of the *ICNA Act*. The accuracy of the information on the MSDS remains the responsibility of the applicant.

12. 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 NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Disposal

- The notified polymer should be disposed of by incineration or landfill.

Emergency procedures

- Spills/release of the notified polymer should be handled by absorbing onto an inert material (such as vermiculite), then placing in a container for chemical waste.

12.1. Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under subsection 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 subsection 64(2) of the Act:
 - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.