

File No: PLC/375

17 September 2003

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

FULL PUBLIC REPORT

Polymer in Ambersep 900 (SO4)

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 and Heritage.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at:

Library
National Occupational Health and Safety Commission
25 Constitution Avenue
CANBERRA ACT 2600
AUSTRALIA

To arrange an appointment contact the Librarian on TEL + 61 2 6279 1161 or + 61 2 6279 1163.

This Full Public Report is 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
Chemicals Notification and Assessment**

TABLE OF CONTENTS

FULL PUBLIC REPORT.....	3
1. APPLICANT AND NOTIFICATION DETAILS.....	3
2. IDENTITY OF CHEMICAL	3
3. COMPOSITION.....	3
4. INTRODUCTION AND USE INFORMATION.....	4
6. PHYSICAL AND CHEMICAL PROPERTIES.....	4
7. HUMAN HEALTH IMPLICATIONS.....	5
7.1. Toxicology.....	5
7.2. Occupational Health	5
7.3. Public Health	5
8. ENVIRONMENTAL IMPLICATIONS	5
8.1. Ecotoxicology.....	5
8.2. Environmental Contamination.....	5
9. RISK ASSESSMENT	7
9.1. Environment	7
9.2. Occupational Health and Safety	7
9.3. Public Health	7
10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS.....	7
10.2. Environmental risk assessment.....	7
10.3. Human health risk assessment	7
12. RECOMMENDATIONS	7
12.1. Secondary notification.....	8
13. BIBLIOGRAPHY	8

FULL PUBLIC REPORT**Polymer in Ambersep 900 (SO4)****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Rohm and Haas Australia Pty Ltd of 4th Floor, 969 Burke Road, Camberwell, VIC 3124 (ABN 29 004 513 188)

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: Chemical name, CAS number, molecular and structural formula, means of identification, molecular weight details, charge density, constituent monomers, residual monomers and impurities, reactive functional groups, import volume, site of reformulation, purity.

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, Japan

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in Ambersep 900 (SO4)

3. COMPOSITION

POLYMER CONSTITUENTS

The notified polymer is composed of monomers that are listed on AICS

PLC CRITERIA JUSTIFICATION

Functional Group	Category	Equivalent Weight
Quaternary Amine	High Concern	≈ 2000*
* The FGEW was calculated on the charge weight of the monomer with which it is expected to react, as a large excess of the amine is used in the manufacture of the polymer. Some reaction may occur between the amine and other monomers, in which case the FGEW may be slightly higher.		
Molecular Weight	The notified polymer meets the molecular weight criteria	
Charge Density	The notified polymer is cationic. However, it is a solid material that is not soluble or dispersible in water.	
Elemental Criteria	The notified polymer contains only approved elements.	
Degradability	The notified polymer is not biodegradable.	
Water Absorbing	The notified polymer is not a water-absorbing polymer.	
Residual Monomers	All residual monomers are below the relevant cut-off.	
Hazard Category	The notified polymer is not classified as a hazardous substance.	

The notified polymer meets the PLC criteria.

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>	<30	<30	<30	<30	<30

USE

The notified polymer is intended for use in the demineralisation of water.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	White beads in an aqueous slurry.
Melting Point/Glass Transition Temp	>100°C
Density	1000-1200 kg/m ³
Water Solubility	<5 mg/L at 20°C The notified polymer (1 g) was accurately weighed and added to Milli-Q water (900 mL) with constant stirring. Samples of the solution taken after 0.5, 1, 2, 3, 4, 5, 6 h and 1, 6, and 7 days were analysed for total organic carbon (TOC) content. The readings varied between 2.8-4.2 ppm and would include other water soluble components. The notified polymer is classified as being slightly soluble (Mensink 1995).
Particle Size	0.6-1 mm
Degradation Products	None expected
Loss of monomers, other reactants, additives impurities	Residual monomers <0.05%

OTHER PROPERTIES

Hydrolysis as a Function of pH	The notified polymer does not contain any hydrolysable groups, and is not expected to undergo hydrolysis in the environmental pH range of 4-9.
Partition Coefficient (n-octanol/water)	The notified polymer's low water solubility and likely hydrophobic nature are indicative of partitioning into the octanol phase.
Adsorption/Desorption	The notified polymer is expected to have a high affinity for soil and sediment and be immobile in the environment due to its low water solubility and charged nature.
Dissociation Constant	The notified polymer contains quaternary amine functionality and is expected to remain fully dissociated.

7. HUMAN HEALTH IMPLICATIONS

7.1 Toxicology

7.1.1 Toxicological Investigations

No toxicological data were submitted. The following toxicological information for a structurally similar polymer has been taken from the MSDS provided by the notifier.

<i>Endpoint and Result</i>	<i>Assessment Conclusion</i>
Rat, acute oral	low toxicity LD50 >5000 mg/kg bw
Rat, acute dermal	low toxicity LD50 >5000 mg/kg bw
Genotoxicity - bacterial reverse mutation	non mutagenic

7.1.2 Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

7.2 Occupational Health

7.2.1 Occupational Exposure

- Waterside workers (5) and transport and warehouse workers (10-20) may be exposed to the polymer slurry in the event of a spill.
- Exchange resin column handlers may be exposed to the polymer slurry during pumping operations to load and unload the filter columns.

7.2.2 Exposure Assessment

Dermal and ocular exposure may 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.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

7.3 Public Health

7.3.1 Public Exposure

- The notified polymer is intended only for use in industry.

7.3.2 Exposure Assessment

As the notified polymer will not be available to the public, no public exposure is expected to occur.

8. ENVIRONMENTAL IMPLICATIONS

8.1 Ecotoxicology

8.1.1 Ecotoxicological Investigations

No toxicological data were submitted.

8.1.2 Environmental Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

8.2 Environmental Contamination

8.2.1 Environmental Exposure

The notified polymer will be imported as an aqueous slurry in 200 L plastic drums and will not be reformulated prior to use. The majority of the notified polymer will be loaded into ion-exchange columns used to demineralise water. At the end of its useful life, the spent resin will be removed from the columns and placed in the empty import drums prior to disposal in landfill. During the loading of the ion-exchange columns, the notifier estimates that up to 60 kg per annum of waste containing the notified polymer will be generated from minor spills. Presumably, these wastes will also be placed in drums and disposed of to landfill.

8.2.2 Exposure Assessment

The notified polymer has low water solubility and, as a result, will be immobile in both the terrestrial and aquatic compartments. As a consequence, any of the notified polymer that escapes from the landfill drums is expected to associate with the soil matrix and sediments and slowly degrade through abiotic and biotic processes to water vapour and oxides of carbon and nitrogen.

The notified polymer is not expected to cross biological membranes due to its very high molecular weight and low water solubility and is therefore not expected to bioaccumulate (Connell 1989).

9. RISK ASSESSMENT

9.1. Environment

Little of the insoluble ion-exchange resin will be released to the environment during its use. However, most of the notified polymer at the end of its useful life will be contained within drums and disposed of to landfill and, as such, is expected to be immobile and pose little risk to the environment.

The notified polymer is not likely to present a hazard to the environment when it is stored, transported and used in the proposed manner.

9.2. Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low due to the expected low toxicity of the polymer and the low potential for exposure.

9.3. Public health

As there will be no exposure of the public to the notified polymer or products containing the notified polymer the risk to the public from exposure to the notified polymer is considered low.

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 No Concern to occupational health and safety under the conditions of the occupational settings described.

10.3.2. Public health

There is Negligible Concern to public health.

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 to landfill.

Emergency procedures

- Spills/release of the notified polymer should be contained as described in the MSDS (ie. Transfer spilled material to a suitable container) and the resulting waste disposed of to an authorised landfill.

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.

13. BIBLIOGRAPHY

- Connell DW (1989) General characteristics of organic compounds which exhibit bioaccumulation. In: Connell DW ed. Bioaccumulation of xenobiotic compounds. Boca Raton, USA, CRC Press, pp 47-57.
- Mensink B. J. W. G., Montforts M., Wijkhuizen-Maslankiewicz L., Tibosch, H. and Linders, J. B. H. J.; "Manual For Summarising and Evaluating the Environmental Aspects of Pesticides"; National Institute of Public Health and Environmental Protection, Bilthoven, Netherlands, July 1995.
- NOHSC (1994a) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (1994b) 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 (1999a) List of Designated Hazardous Substances [NOHSC:10005(1999)]. National Occupational Health and Safety Commission, Canberra, AusInfo.