File No PLC/932

August 2010

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polyacrylate in DynamX

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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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Akzo Nobel Pty Limited (ABN 59 000 119 424)
8 Kellaway Place
Wetherill Park NSW 2164

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/Impurities, Use Details and 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
None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
DynamX

MOLECULAR WEIGHT (MW)
Number Average Molecular Weight (Mn) > 10,000 Da

REACTIVE FUNCTIONAL GROUPS
The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION

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

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	Transparent solution*
Melting Point/Glass Transition Temp	Not determined
Density	~ 1000 kg/m^3 at 20°C*
Water Solubility	Not determined. The notified polymer is expected to be water dispersible based on the presence of polar functionality and the use pattern in water containing solvent systems.
Dissociation Constant	Not determined. The notified polymer is a salt, and is expected to be ionised under environmental conditions.
Particle Size	Imported in solution
Reactivity	Stable under normal environmental conditions. The notified polymer is expected to be hydrolytically stable in the environmental pH range (4-9) at ambient temperature.
Degradation Products	None under normal conditions of use

*The notified polymer is manufactured in an aqueous solution and it can not be isolated from the solution.

5. INTRODUCTION AND USE INFORMATION

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	< 10	< 10	< 10	< 10	< 10

Use
The notified polymer is an ingredient in hair fixative products such as sprays and gels (< 5%). The final product will be used by the public or by salon workers in the hair care industry.

Mode of Introduction
The notified polymer will be imported into Australia in 25 kg pails and 200 L drums at a concentration of up to 10% in a water/ethanol solution, and transported to the notifier's warehouse by road prior to distribution to customer sites for formulation of end products.

6. HUMAN HEALTH IMPLICATIONS

Hazard Characterisation
No toxicological data were submitted. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

Occupational Health and Safety Risk Assessment
Beauticians and hairdressers may experience dermal and ocular exposure during application of various hair care products containing the notified polymer (< 5%). The level and route of exposure will vary depending on the product, method of application and work practices employed. Exposure is not expected to be significant given the low concentration of the notified polymer in finished products. The use of gloves would further reduce dermal exposure.

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

Public Health Risk Assessment
The notified polymer will be present in hair care products at < 5%. Dermal exposure to the notified polymer is expected to be extensive but will vary depending on individual use patterns. Although the public will be exposed to the notified polymer during use of hair care products, the risk to public health is not considered to be unacceptable due to the predicted low hazard of the notified polymer.

7. ENVIRONMENTAL IMPLICATIONS

Hazard Characterisation
No ecotoxicological data were submitted. Anionic polymers are generally of low toxicity to fish and daphnia, however they are known to be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This is unlikely to apply to the notified polymer. Additionally, the toxicity to algae is likely to be further reduced due to the presence of calcium ions in the aquatic compartment which will bind to the acid functional groups.

Environmental Risk Assessment
The imported notified polymer will be reformulated into hair fixative products in Australia. The majority of the notified chemical is expected to be released to sewer as a result of removal of hair products during bathing and, to a lesser extent, from untreated aqueous waste from formulation. Empty import and product containers containing notified polymer residue (estimated to be < 4% of the annual import volume) will be disposed of to landfill or metal reclamation facilities. A predicted environmental concentration (PEC) for a worst case scenario can be calculated on the assumptions that 100% of the total annual import volume is released to sewer nationwide, and that none of the notified polymer is removed by sewage treatment plant (STP) processes. The PEC_{river} is 6.47 µg/L if the daily chemical release (10,000 kg/365 = 27.4 kg) is diluted by the daily effluent production (200L/person/day × 21.16 million people = 4,232 ML).

The maximum concentration of notified polymer in rivers following discharge of treated effluent is well below the EC50 for algae of the most toxic anionic polymers (EC50 > 1 mg/L). The notified polymer is also expected to be removed from influent by up to 75% via adsorption to sludge during STP processes which will further reduce the concentration of the polymer entering the aquatic environment. The notified polymer will not bioaccumulate and is likely to be removed from the water column by sorption to solids over time. As a result, the notified polymer is not expected to occur in surface waters at toxicologically significant concentrations even under a worst case scenario. The notified polymer is therefore not likely to pose a risk to the aquatic environment when used and disposed according to the typical pattern for hair care products.

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 its 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.

Disposal

- The notified polymer should be disposed of to 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 an ingredient in hair fixative products such as sprays and gels, 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.

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 product containing 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.