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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Oxyalkylated Alkylphenolic Resin in M-1758

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Enquiries contact Chemical Assessment on (02) 565 9464:

Street Address: 92 Parramatta Rd Camperdown, NSW 2050, AUSTRALIA

Postal Address: GPO Box 58, Sydney 2001, AUSTRALIA

Telephone: (61) (02) 577-9466 **FAX (61) (02) 577-9465**

Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

Oxyalkylated Alkylphenolic Resin in M-1758

1. APPLICANT

Tretolite Proprietary Limited c/o Clayton Utz 1 O'Connell Street SYDNEY NSW 2000 have submitted a notification statement accompanying their application for assessment of a synthetic polymer of low concern Oxyalkylated Alkylphenolic Resin in M-1758.

2. IDENTITY OF THE POLYMER

Based on the nature of the chemical and the data provided, Oxyalkylated Alkylphenolic Resin in M-1758, is not considered to be hazardous. Therefore, the exact chemical identity, import volume and site of reformulation have been exempted from publication in the Full Public Report.

2. IDENTITY OF THE POLYMER

Other name: polymer in M-1758, oxyalkylated alkylphenolic resin

Trade name: M-1758 (formulation, polymer in solvents)

Number-average molecular weight: >1000

Weight-average molecular weight: >1000

Maximum percentage of low molecular weight species (polymers and oligomers)

- . (molecular weight < 1000): <5%
- . (molecular weight < 500): <1%

Means of identification (List of spectral data available):

FTIR and GPC (solvent not included in GPC calculations); a GPC trace was provided by the notifier that confirms the number average molecular weight.

3. PHYSICAL AND CHEMICAL PROPERTIES

The notified polymer will be imported as part of the formulation M-1758, for use as an oil additive, and will never be isolated. The following data refer to the formulation unless otherwise stipulated.

Appearance at 20°C and 101.3 kPa: amber liquid, formulation - polymer not isolated from solvent

Odour: aromatic

Melting Point:	not available for polymer, manufactured in solvent
Specific Gravity:	0.95 (formulation)
Density:	950 kg/m ³ at 15.5 °C
Water Solubility:	estimated as <1 mg/L
Hydrolysis as a function of pH:	not available, polymer contains no groups that would hydrolyse under environmental conditions
Flammability Limits:	not determined
Flash Point:	69°C (formulation)
Autoignition Temperature:	not determined
Explosive Properties:	combustible liquid (formulation)
Reactivity:	not reactive
Particle size distribution:	not applicable as polymer manufactured in solvent and not isolated

4. PURITY OF THE CHEMICAL

The maximum weight-percentage of a residual monomer is 0.4%. The other residual monomers have not been measured for this polymer but are expected to be < 0.1 % (based on notifier's experience of these monomers in similar products). The residual monomer at a concentration of 0.4% would be classified as a category 3 carcinogen on the basis of skin carcinoma formation in mice and negative *in vitro* tests (1); the concentration threshold for a category 3 carcinogen is $\geq 1\%$ (2). If the concentration equals or exceeds this value then the polymer would be classified as hazardous and would therefore not meet the Polymer of Low Concern (PLC) criteria. A second residual monomer is a category 1 carcinogen (2) and has a concentration cutoff of $\geq 0.1\%$ as a hazardous substance. In the polymer it is at a concentration of <0.1%. Of the other monomers, one is toxic by oral, dermal and inhalatory exposure and can cause burns. However all of the hazardous monomers present as residuals in the polymer are below the level where the polymer would be considered hazardous. Therefore, on the basis of the residual monomers present, their concentration in the polymer, and the chemical and physico-chemical information on the notified chemical, it would not be classified as hazardous according to the Worksafe Australia's *Approved Criteria for Classifying Hazardous Substances* (2).

The notified polymer is only imported as a component of the formulation M-1758 and never isolated. The formulation is not classified as hazardous. The formulation consists of:

Table 3: Maximum weight-percentage of components of formulation M-1758.

Name	CAS No	Proportion (Wt%)
xylene (ortho)	95-47-6	1-5
trimethylbenzene	95-63-6	1-5
diethylbenzenes	25340-17-4	5-10
light aromatic naphtha	64742-95-6	10-30
oxyalkylated alkylphenolic resin M-1758	68784-99-6	<50-83

Xylene is harmful by inhalation and dermal exposure; the exposure standard is TWA 80 ppm (350 mg/m³) (4), the cutoff for hazard classification in a mixture is 12.5% (3). Trimethyl benzene (mixed isomers) is irritating to the respiratory system and has a TWA of (25ppm or 125 mg/m³); the cutoff for a hazardous classification in a mixture is 20% for the mixed isomers (3). The other components of the formulation are not listed in the List of Designated Hazardous Substances (3). Oxyalkylated Alkylphenolic Resin is classified as non hazardous. On the basis of the toxicological information on diethylbenzene and light aromatic naphtha provided in the Material Safety Data Sheet (MSDS), LD₅₀ oral (rat) =3g/kg bw and LC₅₀ inhalation 18 g/m³/4 hours and the information stated above the formulation M-1758 would not be classified as harmful according to the criteria of Worksafe Australia (2).

5. INDUSTRIAL USE

The notified substance will not be manufactured locally but will be imported at the rate of <100 tonnes per year for the first five years. The polymer (in a solvent solution, M-1758, or as part of a preformulated fuel additive package) will be added to fuels at a final concentration of approximately 4 mg/L using positive displacement pumps and piped from the drum containing the polymer solution. This will occur at the refineries in an industrial setting.

6. OCCUPATIONAL EXPOSURE

Oxyalkylated Alkylphenolic Resin in M-1758 is used in an industrial setting as an additive and blended with other components to make motor vehicle fuel. The polymer, as a solvent solution, is added to the petroleum fuels in part per million quantities using positive displacement pumps. M-1758 containing the notified polymer is piped from its holding drums using positive displacement pumps. There is a risk of exposure to the worker making the initial hard piped connection. To minimise the risk associated with exposure to petrochemicals, refinery workers routinely wear eye (goggle) and skin (gloves and often aprons) protection to prevent dermal exposure. Exposure to the polymer through ingestion is unlikely but possible through inhalation. The changeover period, when the now empty drum previously containing the polymer is replaced, could not be estimated by the notifier due to unknown variables such as use level and amount of fuel being treated.

The refinery workers using the polymer are trained in the hazards involved in handling organic solvents during petrol manufacture and the training is not expected to be augmented to take account of the new polymer.

No procedures for atmospheric or biological monitoring have been established.

7. PUBLIC EXPOSURE

The submission does not clearly indicate how the product M-1758 will be transported, but implies that transport will be in drums. Public exposure to the notified chemical might occur during accidents in storage, transfer operations and transport, but as this product is used at refineries, such exposure should be minimal. Once blended, the fuel containing the polymer will be loaded into tank trucks of varying capacity (ca. 15000 L) for delivery to service stations.

The notified substance will not be sold to the public in unblended form, but will be used only in the in the blending of fuel additives to be used by refineries, where it will be added in parts-per-million quantities to the fuels either using positive-displacement pumps 'hard piped' (closed system) from the drum containing the polymer solution. Exposure of the public to the notified polymer at that stage is expected to be minimal.

Recovery of fuel from hoses used to fill or unload tanks is complete as good engineering practice dictates that all lines drain without creating waste or releases to the environment. Spills may occasionally occur at service stations, but the impact should be minimised by the use of the recommended cleanup procedures.

The product is expected to be completely consumed by combustion to produce non-toxic combustion products such as water and oxides of carbon, and dermal contact as a result of splashes from the formulated motor fuel is not considered to be a significant means of exposure due to the low concentration of the product in the fuel. Public exposure through fuels is thus expected to be minimal.

8. ENVIRONMENTAL EXPOSURE

Release

Release to the environment during transfer would only be significant in cases of spills. If this were to occur within the confines of the refinery, it would be contained in bunded areas with cleanup procedures that are well rehearsed and comprehensive. The polymer will be added to fuels using a closed hard piped application system with a final concentration in fuel of approximately 4 mg/L. Fuel containing the polymer is loaded into tank trucks of varying capacity (15,000 L is common) for delivery to service stations. Recovery of fuel from hoses used to fill or unload tank trucks is complete as good engineering practice dictates that all lines drain without creating waste or releases to the environment. Spills do occur occasionally at service station fuel pumps but the notifier has no data on the frequency. Unless the spill was unusually large, the low concentration of polymer in the fuel would translate to a minimal release to the environment. Any environmental releases during normal use would be expected to be minimal.

Fate

As an additive to motor vehicle fuels, the polymer will be subjected to combustion at the temperatures and pressures in vehicle engines. The notifier expects that Oxyalkylated Alkylphenolic Resin M-1758 will be completely combusted to oxides of carbon and water although no supporting data are available. Based on information from similar polymers, the company expects that the polymer will not be released to the environment in significant quantities during normal use.

Small spills of the polymer are to be absorbed with a suitable chemical absorbent and disposed of in accordance with regulations. In the case of large spills, the area is to be dyked to prevent entry into any sewer or waterway. The liquid is then to be transferred to a holding container and any residual treated as in a small spill.

9. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided. This is acceptable for polymers of low concern of number-average molecular weight (NAMW) >1000 according to the Act.

10. ASSESSMENT OF ENVIRONMENTAL HAZARD

The hazard to the environment is limited by the low concentration in motor vehicle fuel (4 ppm) and limited release to the environment until incineration in the combustion chamber of the engine and final release as part of the exhaust gases.

11. ASSESSMENT OF OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY EFFECTS

Oxyalkylated Alkylphenolic Resin in M-1758 has been notified as a synthetic polymer of low concern under section 23 for the purposes of section 24A of the Act. The polymer meets the criteria for a synthetic polymer of low concern specified in regulation 4A of the Act and therefore is considered of low hazard to human health.

The following toxicological information on the formulation M-1758 containing the Oxyalkylated Alkylphenolic Resin (reports unsighted) at a concentration of 50-83 % was provided by the notifier as part of the PLC submission: oral LD₅₀ in rats >2000mg/kg, no deaths or signs of systemic toxicity, abnormal body weight increases and no abnormalities at necropsy. M-1758 was found to be non-mutagenic under conditions of a reverse mutation assay (Ames test).

The notified polymer has a NAMW of >1000, which should preclude transmission across biological membranes such as skin and the gastrointestinal tract, and therefore is not expected to lead to significant toxicity. The polymer contains no reactive functional groups. The content of hazardous individual residual monomers is below that which would require the polymer to be classified as hazardous. The notified polymer is therefore not classified as hazardous according to the criteria of Worksafe Australia on the basis of the chemical and physico-chemical information submitted, however there is no toxicological data to confirm this. The notified polymer

is only imported as a component of the formulation M-1758 and is never isolated. This mixture is not classified as hazardous on the basis of its composition and toxicological information listed in the MSDS. The mixture has the potential to be a skin and eye irritant and be harmful if swallowed (although the results of the rat oral toxicity test indicate it is not toxic); appropriate safety precautions are specified in the MSDS. These precautions will also minimise exposure to the notified polymer.

Occupational exposure to both the notified polymer and formulation M-1758 via skin, eye and inhalation could occur during reformulation processes when blending petroleum. This will usually be limited to those times when pipe connections to the drums containing the imported formulation, M-1758, are made. Employees should be taking precautions associated with the handling of petroleum, these include the use of personnel safety equipment which will minimise exposure to the notified polymer.

The public will not normally be exposed to the notified polymer during its importation and formulation into motor fuel additives. Public exposure to the notified polymer during accidents in storage, transfer/pumping and transport is likely to be limited in extent. The public may be exposed to fuels containing the notified polymer.

Little information is available on the toxicological properties of the notified polymer. However, the properties suggest that should exposure occur absorption of the notified polymer is unlikely, resulting in low risk to public health. The risk to public health from the inclusion of the notified polymer in chemicals is likely to be minimal due to its low concentration in the finished product.

12. RECOMMENDATIONS

To minimise occupational exposure to Oxyalkylated Alkylphenolic Resin in M-1758 the following guidelines and precautions should be observed:

If engineering controls and work practices are not sufficient to reduce exposure to Oxyalkylated Alkylphenolic Resin in M-1758 to safe level the following personal protective equipment should be used:

- . The appropriate respiratory device should be selected and used in accordance to Australian Standard/ New Zealand Standard (AS/ NZS) 1715 (5) and should conform to AS/NZS 1716 (6).
- . Eye protection (chemical goggles or face shields) should be selected and fitted in accordance to AS 1336 (7) and comply with AS/NZS1337 (8).
- . Industrial clothing must conform to the specifications detailed in AS2919 (9).
- . Impervious industrial gloves should conform to the standards detailed in AS 2161 (10).

- . In addition the following safe practices, as should be followed when handling any chemical formulation, should be adhered to - these include:
 - minimising spills and splashes;
 - practising good personal hygiene; and
 - practising good housekeeping and maintenance including bunding of large spills which should be cleaned up promptly with absorbents and put into containers for disposal.
- . a copy of the MSDS should be easily accessible to employees.

13. MATERIAL SAFETY DATA SHEET

The attached MSDS for Oxyalkylated Alkylphenolic Resin in M-1758 in solvent was provided in a format similar to the Worksafe Australia format (11).

This MSDS was provided by Tretolite 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 Tretolite Pty Ltd.

14. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, secondary notification of Oxyalkylated Alkylphenolic Resin in M-1758 shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

15. REFERENCES

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2. National Occupational Health and Safety Commission, [NOHSC:1008(1994)], 1994. *Approved Criteria for Classifying Hazardous Substances*, AGPS, Canberra.
3. National Occupational Health and Safety Commission, [NOHSC:10005(1994)], 1994. *List of designated hazardous substances*, AGPS, Canberra.
4. National Occupational Health and Safety Commission, [NOHSC:3008(1995)] & [NOHSC:1003(1995)], 1995. *Exposure standards for atmospheric contaminants in the occupational environment*, AGPS, Canberra.
5. Standards Australia, Standards New Zealand, 1994. *Australian/New Zealand Standard 1715 - 1994 Selection, Use and Maintenance of Respiratory Protective Devices*. Standards Association of Australia Publ., Sydney,

Australia, Standards Association of New Zealand Publ., Wellington, New Zealand.

6. Standards Australia/ Standards New Zealand, 1991. *Australian/New Zealand Standard 1716 - 1991 Respiratory Protective Devices*. Standards Association of Australia Publ., Sydney, Australia.
7. Standards Australia, 1994, *Australian Standard 1336-1994, Recommended Practices for Eye Protection in the Industrial Environment*, Standards Association of Australia Publ., Sydney, Australia.
8. Standards Australia, Standards New Zealand 1992, *Australian/ New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ. Wellington, New Zealand.
9. Standards Australia, 1990 Australian Standard 3765 - 1990. *Clothing for Protection Against Chemical Hazards*, Part 1, *Protection against General or Specific Chemicals*; Part 2, *Limited Protection Against Specific Chemicals*, Standards Australia Publ., Sydney, Australia.
10. Standards Australia, 1978. *Australian Standard 2161-1978, Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standards Association of Australia Publ., Sydney, Australia.
11. National Occupational Health and Safety Commission, 1994, *National Code of Practice for the preparation of Material Safety Data Sheets* [NOHSC:2011(1994), AGPS, Canberra.