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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

TLA-1605 POLYMER

This Assessment has been compiled in accordance with the provisions of *the Industrial Chemicals (Notification and Assessment) Act 1989*, and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by Worksafe Australia which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Commonwealth Environment Protection Agency and the assessment of public health is conducted by the Department of Health, Housing, Local Government and Community Services.

For the purposes of subsection 78(1) of the Act, copies of this full public report may be inspected by the public at the Library, Worksafe Australia, 92-94 Parramatta Road, Camperdown NSW 2050, between the hours of 10.00 a.m. and 12.00 noon and 2.00 p.m. and 4.00 p.m. each week day except on public holidays.

Under subsection 34(2) of the Act the Director of Chemicals Notification and Assessment is to publish this Report in the next available Chemical Gazette.

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**TLA-1605 POLYMER****1. APPLICANT**

Shell Company of Australia Limited, 1 Spring St, Melbourne, Vic, 3000

2. IDENTITY OF THE POLYMER

Based on the nature of the chemical and the data provided, TLA-1605 Polymer is not considered to be hazardous. Therefore, the chemical identity has been exempted from publication in the full public report.

Trade name: The polymer itself has no trade name but is contained in the imported product TLA-1605 at 40% (v/v) in neutral oil

Number-average molecular weight: c. 6000

Weight-average molecular weight: c. 12000

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

- . (molecular weight < 1000): Nil
- . (molecular weight < 500): Nil

Means of identification (List of spectral data available):

Infrared spectrum

The polymer contained in TLA-1605 is prepared in neutral oil and is never isolated. The following properties are those of this preparation.

Appearance at 20°C and 101.3 kPa: red, viscous oily liquid

**Melting Point/
Glass-transition**

Temperature: not applicable

Density: 905.4 kg/m³

Water Solubility: << 1000 mg/L. Only a limit value was provided, based on an experiment involving heating of the dispersant in water for 20 minutes at this nominal concentration, followed by cooling. Most of the material remained undissolved, but UV spectra

indicated that some dissolution had taken place. However, it was not possible to quantify its extent as the notified dispersant is a substance of unknown and variable composition. Although this criterion is not strictly satisfied, the proposed use of the polymer is not expected to entail significant aquatic exposure.

Hydrolysis as a function of pH:

Hydrolysis is not expected to occur under the anhydrous conditions prevailing in the crankcase. The proposed use of the polymer is not expected to entail significant aquatic exposure. Low solubility would limit the rate at which hydrolysis may occur in the environment.

Thermal stability and reactivity:

To be classified as a polymer of low concern, a substance should not undergo thermal decomposition under conditions of use. While this criterion is not strictly fulfilled, this is not considered relevant given that combustion of lube oil ingredients is an inevitable consequence of their use.

Charge density:

Although the finished polymer would retain some amine functionality, this does not occasion concern as the proposed use of the polymer should not entail significant aquatic exposure.

Particle size: not applicable

4. PURITY OF THE CHEMICAL

The maximum weight-percentage of residual monomers is 11%. However, the majority (a maximum of 10%) is represented by a high molecular weight polymer which is not considered to be hazardous.

No impurities other than residual monomers alone or in combination are present.

5. INDUSTRIAL USE

The notified chemical will be used as an oil additive. It functions as a dispersant additive to solubilise sludge and inhibit the formation of sludge precursors in engine oil.

6. OCCUPATIONAL EXPOSURE

The notified polymer is expected to be imported in 205 litre metal drums during the first two years and then in 20 tonne

isotanks at a rate of 20 - 30 tonnes per year for the first five years. The notified polymer may also be imported in a lube oil additive package.

The lubricant additive package may be supplied to approximately 3 locations at most for storage and warehousing prior to distribution and for blending motor oils which will then be distributed to the general public. The final concentration of polymer in oils sold to the public is about 3%.

Exposures will be approximately 2 hours per day for sampling operations, 6 hours/day for tanker loading/unloading and drum filling and 6 hours/day for blending operations for approximately 10 days per year. In all of these operations closed systems serve to minimise exposure.

7. PUBLIC EXPOSURE

Public exposure during distribution of the notified polymer is not expected to occur.

Despite the limited information on the batch blending processes involved in the manufacturing of motor oil, no public exposure is expected.

No public exposure is expected to result from disposal of any waste notified polymer or from its combustion.

Public exposure to the notified polymer is expected to result from the addition and replacement of motor oil.

8. ENVIRONMENTAL EXPOSURE

. Release

Formulation of the notified polymer into engine oils is a simple blending process that would not be expected to give rise to significant environmental exposure. Finished motor oils contain about 3% of the dispersant. The applicant estimates that approximately 3 kg of the dispersant may be lost from a 20 tonne batch of finished oil as slops or washings. Such releases would be contained in appropriate compounds or pits prior to treatment and disposal.

Some potential for environmental exposure occurs with disposal of used lubricants. However, it has been estimated (1) that 96% of used oil collected in Australia is combusted as fuel oil blends, notably in cement kilns. Significant aquatic exposure to the dispersant is not expected as good industrial and public practice excludes engine oils from aquatic systems.

. **Fate**

The dispersant will share the fate of the engine oils into which it is formulated. Some will be combusted during use, as will be much of the remainder as spent engine oils are likely to be burnt as fuel. Combustion will destroy the dispersant.

Minor amounts may enter the environment from leaky engines. Such releases would be widely dispersed. Residues washed from highways would be expected to become immobile in adjacent soils or sediment because of the low water solubility and high molecular weight of the dispersant. Hydrolysis or biodegradation would occur very slowly, if at all.

9. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided, which is acceptable for polymers of low concern.

10. ASSESSMENT OF ENVIRONMENTAL HAZARD

TLA-1605 contains an alkenylsuccinimide based polymer that is not expected to enter the environment in significant quantities. The predicted environmental hazard is minimal.

11. ASSESSMENT OF OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY EFFECTS

TLA-1605 polymer has been notified as a synthetic polymer of low concern under section 23 for the purposes of section 24A of the *Industrial Chemicals Notification and Assessment Act 1989*.

The physico-chemical properties of TLA-1605 suggest that the notified polymer is stable at ambient temperature and can be used safely.

As the notified chemical is a high molecular weight polymer, it is unlikely to cross biological membranes and is, therefore, unlikely to be a significant health hazard. TLA-1605 is a slight skin and eye irritant (2) but this has been ascribed to the diluent oil content.

The duration of exposure to the notified polymer is low and exposure is also minimised by the use of closed systems.

The level of low molecular weight species is nil and the levels of residual monomers are low enough to be unlikely to present a significant health hazard.

Given the low intrinsic health hazard of the notified polymer coupled with low potential for exposure, the risk of adverse health effects to workers and the public under normal conditions of use is expected to be minimal.

The polymer does not depart significantly from the criteria for a synthetic polymer of low concern specified in regulation 4A of the Act and can therefore be considered to be of low hazard to human health.

12. RECOMMENDATIONS

To minimise occupational exposure to TLA-1605 polymer the following guidelines and precautions should be observed:

- . if engineering controls and work practices are insufficient to reduce exposure to TLA-1605 polymer to a safe level, then personal protective devices which conform to and are used in accordance with Australian Standards (AS) for eye protection (AS 1336, AS 1337) (3,4), impermeable gloves (AS 2161) (5) and protective clothing (AS 3765.1, 3765.2) (6,7) should be worn;
- . a copy of the Material Safety Data Sheet should be easily accessible to employees.

13. MATERIAL SAFETY DATA SHEET

The attached Material Safety Data Sheet (MSDS) for TLA-1605 was provided in Worksafe Australia format (8).

This MSDS was provided by the Shell Company of Australia Limited 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 the Shell Company of Australia Limited.

14. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989*, secondary notification of TLA-1605 polymer 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

1. *Used Lubricating Oil: Generation, Recovery and Reuse in Australia*, report prepared by Technisearch Ltd for the Waste and Resources Advisory Committee of the Australian and New Zealand Environment Council, February 1991.
2. *TLA-1605 Summary Report*, Commonwealth of Australia Chemical Gazette, No. C 11, 10-11, 1993.
3. Australian Standard 1336-1982, *Recommended Practices for Eye Protection in the Industrial Environment*, Standards Association of Australia Publ., Sydney, 1982.

4. Australian Standard 1337-1984, *Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney, 1984.
5. Australian Standard 2161-1978, *Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standards Association of Australia Publ., Sydney, 1978.
6. Australian Standard 3765.1-1990, *Clothing for Protection Against Hazardous Chemicals, Part 1: Protection Against General or Specific Chemicals*, Standards Association of Australia Publ., Sydney, 1990.
7. Australian Standard 3765.2-1990, *Clothing for Protection Against Hazardous Chemicals, Part 2: Limited Protection Against Specific Chemicals*, Standards Association of Australia Publ., Sydney, 1990.
8. National Occupational Health and Safety Commission, *Guidance Note for the Completion of a Material Safety Data Sheet*, 2nd. edition, AGPS, Canberra, 1990.