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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Polymer, ECA 11981

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

Polymer, ECA 11981

1. APPLICANT

Exxon Chemical Company Australia Ltd, 636 St. Kilda Road, Melbourne, Victoria 3004 has submitted a limited notification for assessment of the polymer, ECA 11981. The notified chemical will be used as a lubricant de-emulsifier and will be imported as a component of a lubricant additive package for automotive use.

2. IDENTITY OF THE CHEMICAL

Based on the nature of the chemical and the data provided, the polymer ECA 11981, is not considered to be hazardous. No toxicological data was provided by the notifier which is acceptable for new synthetic polymers imported at <1tonne/year. The chemical name, CAS number, molecular and structural formulae, molecular weight, composition of the polymer, methods of detection and determination and spectral data have been exempted from publication in the Full Public Report and the Summary Report at the request of the notifier.

Other names:	ECA 11981 or ECA 11981M
Marketing name:	will be marketed in Australia as part of a lube additive package, Paranox 5501
Molecular weight:	the average molecular weight for this chemical is calculated by the notifier as 750; the molecular weight of this chemical is variable and depends on the extent of polymerisation
Number-average molecular weight:	750

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	amber liquid
Odour:	it is expected to have a characteristic hydrocarbon odour
Boiling Point:	not determined; calculated to be 135 °C (xylene).
Glass-transition Temperature:	not given

Specific Gravity:	0.996 at 15ºC.
Vapour Pressure:	not determined; has been calculated as 15 mm Hg at 37°C
Water Solubility:	not determined; the applicant considers it to be insoluble in water, based on the long chain aliphatic portion of the substance
Fat Solubility:	not supplied
Partition Co-efficient (n-octanol/water) log P_{ow}:	not determined
Hydrolysis as a function of pH:	test not performed as the OECD method applies only to water soluble substances.
Adsorption/Desorption:	test not performed; the low water solubility would indicate strong adsorption.
Dissociation Constant:	test not performed; the substance does not contain ionisable groups and measurement would be difficult due to the low solubility in water
Flash Point:	50°C
Flammability Limits:	UEL 6.6% : LEL 1.1%
Combustion Products:	CO_2, CO other products not described
Pyrolysis Products:	not supplied
Decomposition Temperature:	not supplied
Decomposition Products:	not supplied
Autoignition Temperature:	not determined
Explosive Properties:	not explosive
Reactivity/Stability:	ECA 11981 is a stable liquid; product does not degrade, decompose or depolymerize; contact with strong oxidising agents should be avoided
Particle size distribution:	not applicable (liquid)

Comments on physico-chemical data

The boiling point that was calculated is considered low. The imported lube additive package contains xylene. A compound with an average molecular weight of 750 is expected to have a higher boiling point.

The vapour pressure that was calculated is considered high. A compound with an average molecular weight of 750 is expected to have a low vapour pressure at room temperature.

The notified polymer is likely to be insoluble in water, based on the long chain aliphatic portion of the substance.

The partition coefficient is expected to be relatively high due to the low solubility in water.

The notified chemical is a polyester and hydrolysis is possible. However, hydrolysis is not expected under environmental conditions due to the expected low solubility in water.

4. PURITY OF THE CHEMICAL

Degree of purity: purity of ECA 11981 is 94%

Toxic or hazardous impurity/impurities:

Chemical name:	xylene
CAS No.:	1330-20-7
Weight percentage:	6%
Toxic properties:	skin irritant, harmful by inhalation

A TWA of 100ppm (435 mg/m^3) and a STEL of 150 ppm (655 mg/m^3).

Non-hazardous impurity/impurities (> 1% by weight): none

Additive(s)/Adjuvant(s): none

5. INDUSTRIAL USE

The notified chemical will not be manufactured locally. It will only be imported as a component of an additive package at a concentration of <1% (by volume). The package will be marketed as Paranox 5501. The additive package is blended with mineral oil to form engine oil with <0.1% (by volume) being the notified chemical.

Approximately 600kg of ECA 11981 will be imported per annum. ECA 11981 is currently in use as an engine oil additive in the USA. The chemical is listed with the European Inventory EINECS, the USEPA (TSCA) and the Japanese inventory MITI.

6. OCCUPATIONAL EXPOSURE

The notified chemical is only imported as a low concentration component of an additive package. It is imported in bulk and transferred to bulk tankers at the dock, it is then delivered to the notifier's customers. Transferral between the bulk tanks is via hoses and pumps. The bulk tankers are flushed at the customers' facilities with base mineral oil. The additive package is then mixed with base mineral oils prior to drumming and repacking; this procedure is automated. Approximately 20 people will be exposed to the additive package during the transport, mixing and final packaging of the blended engine oil. The breakdown is as follows, 2 employees at the transfer stage at the dock, the driver of the bulk delivery tanker and the remainder at the customers' blending and packaging facilities. Exposure during sampling, blending and container filling will be reduced through local exhaust ventilation. Samples collected for laboratory procedures will be kept under laboratory hoods.

Employees exposed to the additive package (when the notified chemical is in its most concentrated form) during the transfer procedures and prior to blending, will wear protective clothing including chemical resistant gloves, safety goggles/face shields and suitable industrial clothing. During the blending operation employees will wear similar safety wear.

The additive package containing ECA 11981, Paranox 5501, is classified as hazardous. It contains chemicals that may cause skin sensitisation and are skin and eye irritants. Therefore occupational exposure to the additive package should be reduced where possible.

7. PUBLIC EXPOSURE

Approximately 600 kg of ECA 11981, as a component of the oil additive mixture, will be imported in bulk containers to Australia annually. The additive will be blended into engine oils by customers at 6 sites. The additive will be transferred by pumps from the delivery containers to a blending tank, mixed with base mineral oils, and drummed and packed by an automatic process. Delivery tanks and hoses will be flushed with base mineral oil, and losses during the blending process are expected to be minimal. The public is unlikely to be exposed to the chemical during these importation and blending processes.

The finished lubricant will be sold to distributors and retail outlets, vehicle fleet operators and industrial users. It is estimated that 80% of used engine oil is disposed correctly, and the remaining 20% will be disposed mainly to landfill, and the sewage and wastewater systems. The public may be dermally exposed to the chemical when disposing of engine oils.

8. ENVIRONMENTAL EXPOSURE

• Volume

The notified substance will be imported in Australia in the lube additive package Paranox 5501. ECA 11981 will be in a low concentration in the additive package. There is expected to be 600 kg of ECA 11981imported into Austarlia per annum. The additive package will be imported into Australia in bulk containers.

The package will be mixed with mineral oil in Australia to produce engines oils.

• Formulation and handling

The additive product will be piped from the bulk shipping container to road tankers and transported to various customers blending plants, where it will be pumped into blending tanks. The road tanker is then 'cleaned' of the additive by using mineral oil. Once in blending tanks, additional oil is added to the additive package to achieve the desired final product concentration. This operation is computerised. Finally, the product blended with oil is then repackaged into 1/2,1, 4, and 5 litre plastic containers or 20 and 205 litre drums using automated equipment. It is expected that when the various feed lines are flushed with a diluent oil to clean them, the flushing will be retained and re-used as diluent when the next batch of product is blended.

The company has not supplied estimates of losses that may occur as a result of tank filling procedures etc but these are likely to be minor. Any release is expected to occur from accidental spillage, which should be adsorbed onto inert material and then disposed of according to relevant government regulations. The Material Safety Data Sheet (MSDS) does not explicitly detail the recommended disposal route for such spills, other than to indicate that an expert should be consulted and to ensure conformity to local disposal regulation. The common methods of disposal for accidental spills is by landfill or incineration.

• Environmental Fate

The environmental fate of the notified chemical will be closely aligned with the environmental fate of the used engine oil.

The notifier estimates that approximately 80% of used engine oils are presented for proper disposal, mostly from garages and other car service centres. Therefore the notifier estimates that 480 kg of the notified chemical will be to be disposed of with the used engine oil. Using Australian figures for engine oils (1) approximately 40% of the imported chemical should be burned in the engine with the engine oil, 80% of the remainder disposed of "properly" and 20% in the DIY market. In Australia 96% of the collected engine oil is used as fuel or incinerated. Therefore the EPA estimates that 540 kg of the imported material will be eventually burned or incinerated.

The DIY market for all engine oils in Australia is approximately 33 ML and only 5 ML of used oil is collected from this group (1). Assuming that 40% of this oil in the DIY market is burned during use and that 5 ML is collected then 15 ML of oil is disposed

of in various ways. The fate of this used oil is uncertain, with it either ending up in landfill, poured down the drain (both sewage and stormwater), disposed of to land or used to paint fences etc. As the uncollected oil represents approximately 10% of the entire engine oil market, then approximately 60 kg of the notified chemical could enter the environment in various ways as outlined.

As the notified substance has a relatively high MW (> 650) and is expected to have low solubility in water, it is unlikely to cross biological membranes and is unlikely to bioaccumulate.

9. EVALUATION OF TOXICOLOGICAL DATA

The notified chemical has a Number Average Molecular Weight (NAMW) of <1000 but will be imported in quantities of <1000 kg/annum therefore there is no requirement to supply toxicological data for this assessment.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided, which is acceptable for chemical import of <1 tonne per annum, according to the Act. The polymer would not be expected to cross biological membranes, due to its expected low solubility and high molecular weight.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

Due to the proposed use pattern of the notified substance as an additive in engine oils, the anticipated environmental hazard is low. Most of the substance will be burned during use, or when used oil is used as fuel or incinerated. The burning and incineration of the notified substance is expected to generate water and the oxides of carbon.

The main environmental hazard comes from the DIY market when the used oil is not collected. The amount of the notified chemical involved has been estimated at 60 kg per annum. This amount of chemical will be disposed of with the used oil in various areas; soil, landfill or to drains throughout Australia. Due to the expected low solubility in water and resulting high log P, the notified chemical is expected to remain in the soil with the oil and should not leach. Disposal to drains will eventually reach water courses, where the notified chemical should remain with the oil phase or be absorbed to sediment/particles and remain with the sediments. In sediments or at landfill the notified chemical is expected to slowly degrade with the oil, down to monomers, which should decompose further. As ecotoxicological effects are not expected nor is bioaccumulation, the appropriate disposal of the notified chemical in the used engine oil is not expected to pose a significant environmental hazard.

Accidental spills during transport or during formulation are expected to be cleaned up according to the MSDS. The instructions in the MSDS are adequate to limit environmental exposure.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The notified chemical ECA 11981 will only be imported as a component of an additive package in liquid form, Paranox 5501. The additive package is classified as hazardous as it contains chemicals that are skin sensitisers and skin and eye irritants (e.g. xylene). It is not possible to classify the hazardous nature of the polymer on the basis of toxicity data as none was submitted for this assessment. As the notified chemical will be imported in quantities of <1000 kg/annum there is no requirement for the notifier to provide toxicity data. On the basis of the toxicological profile of the polymer's residual monomer or the concentration of the hazardous impurity, xylene (6%), the polymer ECA 11981 would not be classified as hazardous according to the criteria of Worksafe Australia (3). Similarly the chemical structure does not indicate that the polymer has the potential to be highly toxic. The notifier states that it will probably be an eye and skin irritant, the basis for this is the xylene content (6% impurity). The xylene content and the other hazardous contents of the imported formulation (Paranox 5501) indicate that personnel protective equipment as outlined in the recommendations section should be used when exposed to the notified chemical.

Approximately 20 employees will come into contact with the additive package during the transfer and blending procedures. Exposure will be limited by the use of protective clothing and equipment and by the use of local exhaust ventilation. The level of workplace exposure will be further reduced by the automated procedures involved in blending and packaging of the engine oil. A high level of worker exposure is unlikely.

The public is unlikely to be exposed to the notified chemical during the importation and blending operations, however there may be some dermal exposure during the disposal of engine oils containing the chemical.

The notified chemical ECA 11981 will not pose a significant hazard to public health when used in the proposed manner.

13. RECOMMENDATIONS

To minimise occupational exposure to ECA 11981 and to the additive package , Paranox 5501, of which it is a component, the following guidelines and precautions should be observed.

- When using the notified chemical (as the additive package) the following protective equipment should be worn:

  - impervious gloves conforming to Australian Standards (AS) AS 2161 (4),

  - protective eye goggles conforming to AS 1336 (5),and AS/NZS 1337 (6)

  - protective clothing conforming to AS 3765.2 (7), and

  - protective footwear conforming to AS/NZS 2210 (8).

- If mist, vapour or aerosols are generated, and engineering controls are not sufficient to control exposure, the following protective equipment should also be worn:

  - respiratory protection conforming to AS/NZS 1715 (9) and AS/NZS 1716 (10).

- When entering poorly ventilated enclosed spaces, tanks or vessels the following protective equipment should be worn:

  - self-contained breathing apparatus conforming to AS/NZS 1715 (9).

- Safe work practices should be implemented to prevent splashing and spillages.

- Good personal hygiene practices should be observed.

- A copy of the MSDS should be easily accessible to employees.

- If > 1 tonne is imported then the notifier is to inform the director in writting and will be required to submit better physico-chemical data, including water solubility, environmental fate and ecotoxicity and toxicity data.

- Products containing the additive package, which contains the notified chemical, should carry a statement warning against skin and eye contact.

14. MATERIAL SAFETY DATA SHEET

The Material Safety Data Sheet (MSDS) for ECA 11981 was not provided in Worksafe Australia format (2) as only the additive package, Paranox 5501 will be imported. An MSDS for Paranox 5501 was provided in a suitable format.

These MSDSs were provided by Exxon Chemical Company Australia Ltd as part of their notification statement. The accuracy of this information remains the responsibility of Exxon Chemical Company Australia Ltd.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989*, secondary notification of ECA 11981 shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

16. REFERENCES

1. Australian and New Zealand Environment Council, 1991. *Used lubricating oil: Generation, recovery and reuse in Australia*. Prepared by Technisearch Ltd for the Waste and Resources Committee (WRAC).

2. National Occupational Health and Safety Commission, 1994. *National Code of Practice for the Preparation of Material Safety Data Sheets*, [NOHSC:2011(1994)], AGPS, Canberra.

3. National Occupational Health and Safety Commission, 1994. *Approved Criteria for Classifying Hazardous Substances*, [NOHSC:1008(1994)], AGPS, Canberra.

4. Standards Australia, 1978. *Australian Standard 2161-1978, Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves*), Standards Association of Australia Publ., Sydney, Australia.

5. Standards Australia, 1994. *Australian Standard 1336-1994, Recommended Practices for Eye Protection in the Industrial Environment*, Standards Association of Australia Publ., Sydney, Australia

6. 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.

7. 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.

8. Standards Australia, Standards New Zealand 1994. *Australian/ New Zealand Standard 2210 - 1994 Occupational Protective Footwear, Part 1: Guide to Selection, Care and Use. Part 2: Specifications,* Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ. Wellington, New Zealand.

9. 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.

10. Standards Australia, Standards New Zealand, 1991. *Australian/ New Zealand Standard 1716 - 1991 Respiratory Protective Devices,* Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ., Wellington, New Zealand.