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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

SOPROPHOR 4D 384

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 Department of the Environment, Sport, and Territories 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.

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**SOPROPHOR 4D 384****1. APPLICANT**

Ciba-Geigy Australia Ltd of 140 Bungaree Road, Pendle Hill, NSW 2145 has submitted a limited notification statement for an assessment certificate for Soprophor 4D 384.

2. IDENTITY OF THE CHEMICAL

Chemical name: 2,4,6-Tris[1-(phenyl)ethyl]phenyl-omega-hydroxy-poly(oxyethylene) sulphate

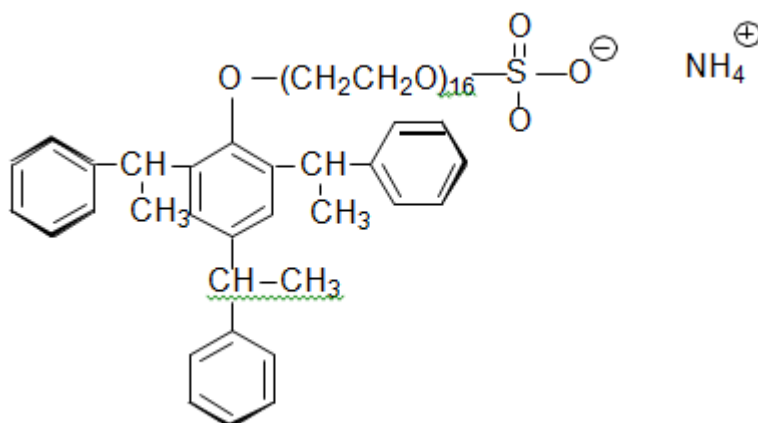
Chemical Abstracts Service (CAS) Registry No.: 119432-41-6

Other name (s): Sulphated polyarylphenolethoxylate

Trade name: Soprophor 4D 384

Molecular formula: C₆₂H₁₀₄O₂₀NS

Structural formula:



Molecular weight: 1230

Method of detection and determination:

The chemical can be identified by infrared spectroscopy.

Spectral data:

Infrared spectrum for SOPROPHOR 4D 384: 709, 1254, 1454, 2888 & 3212 cm⁻¹

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	Brown viscous paste
Odour:	Characteristic
Melting Point:	30°C
Boiling point:	>100°C
Density:	1140 kg/m ³
Vapour Pressure:	9.12x10 ⁻¹¹ kPa at 25°C
Water Solubility:	Highly soluble
Partition Co-efficient (n-octanol/water) log P_{O/W}:	Measured values of 5.6 (0.01M) and 58.1 (0.001M). This parameter is strictly applicable only for substances that do not dissociate in water and are not surface active
Hydrolysis as a function of pH:	Hydrolytically stable in the pH range 5-9 by analogy with nonylphenol ethoxylates (1)
Adsorption/Desorption:	expected to have low mobility in soils because of its surface active properties
Dissociation Constant pKa:	3.35 (mean of 3.30 and 3.39)
Flash Point:	>100°C
Flammability Limits:	Not flammable
Combustion Products:	Not determined
Pyrolysis Products:	Not determined
Decomposition Temperature:	Not determined
Decomposition Products:	Not determined
Autoignition Temperature:	Not determined
Explosive Properties:	Not explosive

Reactivity: Reacts with strong oxidising and reducing agents, strong mineral acids and strong bases

Particle size distribution: Not applicable

4. PURITY OF THE CHEMICAL

Degree of purity: 97.5%

Toxic or hazardous impurities: None

Non-hazardous impurity:

. **Chemical name:** Water
. **Weight percentage:** 2.5% (maximum)

Additive(s)/Adjuvant(s): None

5. INDUSTRIAL USE

The notified chemical will be used as a surfactant in a seed coating product (NACRET). The product containing the notified chemical will comprise up to a maximum of 2% of the seed coating formulation. The product will be used as a colour coding marker and as a binder to be mixed with pesticides for seed treatment. The fully formulated product will be imported and relabelled in Australia.

The projected imported volume of SOPROPHOR 4D 384 is 1 tonne per annum (maximum) for the first year.

6. OCCUPATIONAL EXPOSURE

The product (NACRET) containing Soprophor 4D 384 will be imported to Australia in 200L drums. The Chemical will be used by one seed treatment company in Australia. Approximately 100 storemen and transport personnel will be exposed to NACRET during transport and storage. NACRET is emptied from the drum by means of a tap screwed into the bung hole on the top of the drum and tilting the drum. The chemical is then manually fed into a tank where it is mixed with other agricultural chemicals and seeds. During seed treatment approximately 20 workers will be exposed to SOPROPHOR 4D 384.

The maximum concentration of the notified chemical in NACRET is 2% and is strongly bound to the seed coating product.

7. PUBLIC EXPOSURE

Limited information has been provided in relation to the seed treatment process, however, public exposure to the notified chemical is not expected to occur.

Public exposure resulting from disposal of any waste notified chemical by landfill is not expected to occur.

The product NACRET will not be used by the public and treated seeds are expected to be for agricultural purposes only and no public exposure is therefore, expected to occur.

8. ENVIRONMENTAL EXPOSURE

. Fate

Specific studies describing hydrolysis, photolysis, soil adsorption and soil metabolism of SOPROPHOR 4D 384 were provided by Rhone-Poulenc Geronazzo (France) on the condition that they remain fully confidential. Assessment of these studies has not revealed any cause for environmental concern.

Given its use pattern and properties, SOPROPHOR 4D 384 will mainly become associated with the soil following release to the environment, where it will be exposed to such processes as hydrolysis, microbial metabolism, and sorptive interactions.

The environmental fate of SOPROPHOR 4D 384 and the better known alkylphenolethoxylate surfactants would be expected to share common features. Alkylphenolethoxylates have found wide use in cleaning products and are also present in many agricultural formulations.

Nonylphenolethoxylate is hydrolytically stable but biodegradable, particularly its hydrophilic portion. Residues surviving sewage treatment (principally nonylphenol and mono and di-ethoxylates) sorb to sludge and have been observed to degrade in soil so amended over the course of a few weeks. The presence of the terminal sulphate group should not retard metabolism of SOPROPHOR 4D 384 as microbial sulphatase enzymes are widely distributed in the environment. Sorptive properties should preclude significant aquatic exposure from use as seed dressing.

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicology data have been provided for SOPROPHOR 4D 384 which is acceptable under the Act for a chemical introduced in volumes < one tonne per annum.

10. ENVIRONMENTAL EFFECTS

Specific toxicity test reports for bobwhite quail and mallard ducklings exposed via acute oral and dietary routes to SOPROPHOR 4D 384 were provided by Rhone-Poulenc Geronazzo (France) on the condition that they remain fully confidential. Assessment of these studies has not revealed any cause for environmental concern.

SOPROPHOR 4D 384 would not be expected to exert toxic effects on birds by analogy with the alkylphenolethoxylates, which have well defined aquatic toxicity but are not known to be toxic to birds. The US EPA considers surfactants with molecular weights > 1000 to be surface active agents only and not systemic toxicants, because they are too large to be absorbed.

11. ENVIRONMENTAL HAZARD

The environmental hazard of SOPROPHOR 4D 484 appears low as application rates will be low (generally less than 2 g/ha but may approach 20 g/ha for some vegetable crops) and residues are not expected to persist in soil by analogy with the widely used alkylphenolethoxylates.

Given the low environmental exposure to SOPROPHOR 4D 384, hazard to living organisms is also expected to be low. The highest proposed rate at which NACRET will be applied to seed (3 L per 100 kg) equates to 600 ppm SOPROPHOR 4D 384, well below endpoints characteristic of substances that are nontoxic to birds. Any avian hazard presented by dressed seed would reflect the inclusion of ingredients other than SOPROPHOR 4D 384.

The labels for NACRET should also include the statement "Do not feed treated seed or otherwise expose to native birds or other wildlife."

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

There is no information on the effects of the notified chemical on human health. Chemical being of high molecular weight is unlikely to cross biological membranes and cause systemic damage. However, due to the nature of the dissociation constant (P_{ka} :3.35) with detergent like properties it may be irritating to the eyes, therefore eye contact should be avoided.

The notified chemical being a 2% tightly bound component of a seed coat formulation, under normal use conditions with the use of appropriate personal protection should not pose a significant risk to workers.

No public exposure to the notified chemical is expected to occur and therefore should be negligible risk to public safety.

13. RECOMMENDATIONS

To minimise occupational exposure to SOPROPHOR 4D 384 the following guidelines and precautions should be observed:

- . if engineering controls and work practices are insufficient to reduce exposure to a safe level, the following personal protective equipment which comply with Australian Standards should be worn. safety goggles {(AS 1336-1982 (1), AS 1337-1982 (2)}, gloves (AS 2161-1978 (3), Overalls {AS 3765.1-1990 (4), AS 3765.2-1990 (5)}.
- . Good work practices should be implemented to avoid spillages and splashing.
- . Good personal hygiene practices, such as washing of hands prior to eating food, should be observed.
- . A copy of the Material Safety Data Sheet for the product containing the notified chemical should be easily accessible to workers.

. Labels for NACRET should contain "Do not feed treated seed or otherwise expose to native birds or other wild animals".

14. MATERIAL SAFETY DATA SHEET

The Material Safety Data Sheets (MSDS) for NACRET™ Red Polymer-Binder Seed Coating and NACRET™ Green Polymer-Binder Seed Coating containing the notified chemical (Attachments 1 and 2) were provided in a suitable format (13). These MSDS were provided by Ciba-Geigy Australia 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 Ciba-Geigy Australia Ltd.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act), secondary notification of SOPROPHOR 4D 384 shall be required if:

- . any of the circumstances stipulated under subsection 64(2) of the Act arise; or
- . if the volume of the notified chemical imported exceeds one tonne per annum; or
- . the use pattern should change so as to entail the likelihood of significant aquatic exposure.

The secondary notification dossier should contain data or arguments to address in more detail the fate and effects of the polymer in aquatic and terrestrial environments, as appropriate.

16. REFERENCES

1. Australian Standard 1336-1982, "Recommended Practice for Eye Protection in the Industrial Environment", Standards Association of Australia Publ., Sydney, 1982.
2. Australian Standard 1337-1984, "Eye Protectors for Industrial Applications", Standards Association of Australia Publ., Sydney, 1984.
3. Australian Standard 2161-1978, "Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)", Standard Association of Australia Publ., Sydney, 1978.
4. 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.
5. 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.

6. National Occupational Health and Safety Commission, *Guidance Note for the Completion of a Material Safety Data Sheet*, 2nd. edition, AGPS, Canberra, 1990.