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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Basyntan WL, sodium salt

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

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1. APPLICANT

BASF Australia Ltd, 500 Princes Highway, Noble Park, Vic, 3174.

2. IDENTITY OF THE CHEMICAL

Generic name: Phenolsulfonic acid polymer, sodium salt

Other name: Basyntan WL, sodium salt

Trade names: Basyntan WL Liquid
(Basyntan WL and Basyntan LD6161 for powder product)

Molecular weight:
Number-average molecular weight: >1**000**

Maximum percentage of low molecular weight species (molecular weight < 1000): 15.33

It should be noted that the maximum amount of low molecular weight species < 1000 is high ~15%. The fate and aquatic toxicity of the lower molecular weight species is expected to be similar to the higher molecular weight species.

Method of detection and determination: Gel permeation chromatography; high-performance liquid chromatography; ultra-violet spectroscopy; infra-red spectroscopy.

3. PHYSICAL AND CHEMICAL PROPERTIES

The following physico/chemical data relate to the product Basyntan WL Liquid (containing ~25% notified polymer and ~60% water), or where indicated, the powder Basyntan WL (containing ~80% notified polymer). Data were not supplied for the pure polymer as it will not be imported in this form.

Appearance at 20°C and 101.3 kPa:	pale yellow, slightly viscous liquid
Odour:	
Melting Point/Boiling Point: (water)	melting point ~0°C point ~100°C
Glass-transition Temperature:	°C
Density:	~1200 kg/m3 @ 20°C
Vapour Pressure:	~ 2.3 kPa at 20°C (water)
Water Solubility:	completely soluble in water
Fat Solubility:	
Hydrolysis as a function of pH:	no hydrolysis evident after 48h @ 30°C and pH levels 1, 4, 7, 9, 11 and 14 (Basyntan WL)
Adsorption/Desorption:	test results show an adsorption of 43% of test compound (Basyntan WL) onto activated sludge
Dissociation Constant:	3.50 - 9.30 kPa
Flash Point:	>100 °C
Flammability Limits:	product is not flammable under normal use conditions
Combustion Products:	
Pyrolysis Products:	
Decomposition Temperature:	
Decomposition Products:	no hazardous decomposition products have been observed
Autoignition Temperature:	>200 °C

Explosive Properties: no known explosive properties

Reactivity/Stability: no known reactive properties have been observed

Data were not provided for particle size distribution. This is acceptable as the notified polymer is not expected to be imported in the powder form or form an aerosol.

4. PURITY OF THE CHEMICAL

Degree of purity 94.18%

Toxic or hazardous impurities:

(a) **Chemical name:** formaldehyde
Synonyms: formalin; formic aldehyde; formol; paraform
CAS No.: 50-00-0
Weight percentage: 0.02
Toxic properties: toxic by ingestion (rat oral LD50 800 mg/kg) skin contact and inhalation; suspected human carcinogen; experimental carcinogen, tumorigen and teratogen; experimental reproductive effects; human mutagenic data; severe eye and skin irritant (1); possible skin and respiratory sensitiser (2)
Boiling point: -21°C
WSA exposure standard TWA 1 ppm, STEL 2 ppm (3)

(b) **Chemical name:** urea
Synonyms: carbamide; carbonyldiamine; isourea
CAS No.: 57-13-6
Weight percentage: 0.3
Toxic properties: moderately toxic by ingestion (oral LD50 in rat 14300 mg/kg); experimental carcinogen and neoplastogen; human reproductive effects; experimental reproductive effects; human mutagenic data; human skin irritant (1)

(c) Chemical name: melamine
Synonyms: cyanuramide; cyanurotriamide; cyanurotriamine; 2,4,6-triamino-s-triazine
CAS No.: 108-78-1
Weight percentage: 0.1
Toxic properties: experimental carcinogen and tumorigen; moderately toxic by ingestion (rat oral LD50 3161 mg/kg); eye skin and mucous membrane irritant, causes dermatitis in humans; mutagenic data (1)

Non-hazardous impurity/impurities: 5.4%

Maximum content of residual monomers: 5.82%

Additives/Adjuvants:

The components listed below relate to Basyntan WL Liq**uid.**

Chemical name:	**Weight percentage:** (%w/w)
Notified polymer	~25
Phenolsulfonic acid polymer, ammonium salt	~8
Sulfuric acid salts	<10
Dicarboxylic acids	<10
Water	to 100

5. INDUSTRIAL USE

The notified polymer will be imported as a component of Basyntan WL Liquid which will be used for retanning white and lightfast types of leather. Approximately 10 tonnes of Basyntan WL Liquid will be imported in the first year, 30 tonnes in the second and 50 tonnes in each of the following years. As the notified polymer will constitute ~25% of the product, approximately 3 to 13 tonnes of polymer will be imported per annum.

6. OCCUPATIONAL EXPOSURE

The notified polymer will be imported in the liquid Basyntan WL Liquid in 1000 L aluminium schutz tanks or, when these vessels are unavailable, in polyethylene open head drums with a capacity of 120 kg. Approximately ten transport contractors will be involved in distributing the aluminium schutz tanks containing the liquid to 5 BASF warehouses throughout Australia (Melbourne, Sydney, Adelaide, Perth and Brisbane) and from these warehouses to approximately 10 tanneries. Likely large volume users (>1 tonne per annum) are located at Botany, NSW; Preston and Footscray, Victoria; Hemmant, Queensland; and Thebarton, South Australia. Likely small volume users (<1 tonne per annum) are located at Coogee, Western Australia; Narangbah, Queensland; Campbellfield, Victoria; and South Hobart, Tasmania. The liquid will not undergo any reformulation or repacking in Australia. Users will store 2 aluminium schutz tanks at each site, one for use and one for holding back-up material. It is unlikely that the polymer will be imported as a powder at any time.

A total of 20 to 30 workers will be exposed to the liquid during the leather retanning process. The magnitude and duration of exposure will depend on the feed mechanism employed. Basyntan WL Liquid will be added to retanning vessels either by automatic feed by pumping the product (undiluted) from schutz tanks, or added through an axel feed line by pouring the product (diluted 1:3) from buckets. Retanning vessels will hold up to 500 kg of leather and up to 1000 L of water. The added Basyntan WL Liquid will constitute no more than 12% of the total volume of the vessel (ie, 60 kg). It is envisaged that workers will be exposed for approximately 30 minutes per day if using the bucket feed technique. Work environments are expected to be well ventilated and worker exposure minimised by the use of good work practices and protective equipment. Exposure will be less at tanneries where a direct feed line will be utilized.

An equal number of personnel/technical staff may also be exposed at the warehouses, however this exposure is expected to be limited to accidental spills.

7. PUBLIC EXPOSURE

Basyntan WL Liquid will be imported to Australia and transported (road or rail) to BASF warehouses, and then to the various

tanneries throughout Australia. No reformulation or repackaging will occur in Australia. There is low potential for public exposure during shipment and distribution.

At the tannery, the required amount of Basyntan WL Liquid will be automatically pumped into the processing vessel or added through the axel feed line by pouring from buckets in a diluted 1:3 Basyntan WL Liquid solution. It is claimed that Basyntan WL Liquid can be disposed of by incineration at an approved industrial facility. Small quantities are expected to be collected together with other waste and go to a regulated landfill.

The public is not expected to be directly exposed to the chemical during processing. Public exposure to the chemical in the end use product and from waste disposal is expected to be minima**l.**

8. ENVIRONMENTAL EXPOSURE

. Release

The notifier anticipates a high degree of fixation of the polymer to the leather protein. Approximately 90-95% of the offered amount of Basyntan WL is taken up by the leather during retannage. The notifier anticipates that Basyntan WL Liquid is likely to enter effluent treatment systems at a maximum rate of approximately 0.6%, ie for every 100 kg of Basyntan WL Liquid consumed in a retaining vessel, a maximum of 600 g of unused product is likely to be discharged to wastewater treatment plants. As this product contains ~25% of the polymer and the anticipated import volume varies from 10 to 50 tonnes per annum, the notifier expects that a total between 15 and 75 kg per annum of the notified polymer will be discharged to on-site effluent treatment plants around Australia.

The notifier has provided definitive (measured) information on the amount of polymer in tannery wastewater from a large volume user. The data indicated that between 884 ppm (0.09%) and 2600 ppm (0.26%) of unfixed polymer will be discharged for on-site effluent treatment. As 60 kg of Basyntan WL Liquid which equates to ~15 kg of the notified polymer is used per batch of leather, approximately 39 g (assuming 0.26% unfixed polymer) of the polymer will be discharged for on-site effluent treatment.

The tannery has an effluent discharge rate of 240,000 to 290,000 litres per day. Therefore, the concentration of the polymer in the effluent will be ~0.16 ppm (based on 39 g notified polymer in 240,000 L of effluent). The effluent will be flocculated before discharge to sewer and the bulk of the residual polymer is expected to become associated with the sludge. Any polymer that remains in the treated effluent discharged to sewer will be diluted to levels of less than 1 ppb - based on flow rate of 500 ML/day at a metropolitan sewerage treatment plant.

Treated effluent from tanneries that are discharged to provincial sewage treatment plants will be diluted to levels in the low to sub-ppb range - based on 0.16 ppm polymer in tannery effluent and a flow rate of 5 ML/day at a provincial sewerage treatment plant.

Waste containing the polymer will also be generated when hides are shaved, trimmed and buffed. Such wastes are likely to be landfilled and are expected to be immobile.

. Fate

The main environmental compartment to be exposed to the notified polymer will be the aquatic when spent treatment solution containing traces of the unreacted notified polymer is discharged. The bulk of the notified polymer is expected to be associated with the sludge at the effluent treatment plants.

As the notified polymer contains sulfonic acid moieties it is likely to be susceptible to microbial degradation (4). Some degree of microbial degradation of the notified polymer is likely to occur at wastewater treatment plants (in water and sludge). Any polymer that remains in treated waste water and enters receiving waters is also likely to undergo further microbial degradation in the water or sediment to which it would be expected to partition.

Bioaccumulation of the polymer is unlikely due to its solubility in water, molecular weight greater than 1000 and likely microbial degradation. The lower molecular weight species (MW < 1000) are also unlikely to bioaccumulate due to its expected solubility in water and the presence of amide linkages that are susceptible to microbial degradation.

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicological data were submitted for the notified chemical, which is acceptable for polymers with number-average molecular weight > 1000 according *to the Industrial Chemicals (Notification and Assessment) Act 1989, as* amended (the Act**).**

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided, which is acceptable for polymers of NAMW > 1000 according to the Act.

The notified polymer is a water soluble poly(aromatic sulfonate) polymer and may be of moderate concern for acute toxicity towards fish and green algae. Water soluble poly(aromatic sulfonate) polymers are expected to assert their toxicity by affecting the outer membranes of aquatic organisms of the near environment of the organism - eg. over-chelation of nutrient elements (5). However, adverse effects on aquatic organisms are unlikely due to the nofified polymer's expected low environmental concentration (in the order of sub-ppb).

Likewise, the lower molecular weight species which is a similar type of polymer, is not expected to have adverse effects on aquatic organisms due to its expected low environmental concentration (in the order of sub-ppb**).**

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The aquatic environment will be exposed to the polymer when unfixed residues are discharged with wastewater. However, as noted above, concentrations in tannery wastewater are ~0.16 ppm and will be diluted further to levels in the low to sub-ppb range when the treated effluent enters the sewer system and passes through sewage treatment plants. Predicted environment concentrations following dilution by receiving waters would be expected to be in the sub-ppb range. The polymer is unlikely to be toxic to aquatic organisms at this level. Therefore, the polymer is unlikely to present a hazard to the environment due to its low concentration in receiving waters and its expected low bioaccumulation potential.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The notified chemical is a polymer of molecular weight > 1000. It is therefore unlikely to cross biological membranes and cause any systemic effects. However, 15.33% of the component polymeric species are of molecular weight below 1000, and the polymer itself contains the hazardous impurities formaldehyde (0.02% w/w), urea (0.3% w/w) and melamine (0.1 % w/w). To prevent possible health effects due to these impurities and low molecular weight species, direct contact with the polymer should be avoided.

The residual formaldehyde in the product Basyntan WL Liquid (approximately 0.008% w/w), may result in allergic contact dermatitis in sensitised workers who come in contact with the liquid. Additionally, as formaldehyde is volatile at room temperature, there is a possibility of exposure to formaldehyde vapour. However, as the work environment will be well ventilated and the product will be contained in a closed system during retanning operations, residual formaldehyde should not pose a significant concern to workers.

Basyntan WL Liquid is stable at ambient temperatures, is non-flammable, has no explosive properties and is not expected to react with other materials.

Based on the above information, it is considered unlikely that Basyntan WL Liquid will pose a significant hazard to occupational health and safety when used in the proposed manner.

Due to the low potential for public exposure to the notified chemical under normal conditions of use, there should be negligible risk to public safety.

13. RECOMMENDATIONS

To minimise occupational exposure (and public/environmental if recommendations have been made by these agencies) to Basyntan WL, sodium salt the following guidelines and precautions should be observed:

. The exposure standards for the volatile residual monomer formaldehyde should be observed. Engineering control

procedures such as local exhaust ventilation should be used during retanning operations to meet occupational exposure limits for formaldehyde (3) as described in MSDS for Basyntan WL Liquid. Where feasible, closed systems should be used.

. Avoid prolonged contact with the skin. Avoid contact with the eyes. If engineering controls and work practices are insufficient to reduce exposure to a safe level, the following personal protective equipment which complies with Australian Standards should be worn such as chemical-type goggles with face shield recommended to prevent eye contact (6), chemically resistant gloves such as chloroprene, nitrile, PVC or rubber(7) and protective clothing (8) to prevent skin contact.

. Good work practices should be implemented to avoid splashing or spillages.

. Good personal hygiene practices, such as washing of hands prior to eating food, should be observed.

. A copy of the MSDS for products containing the notified polymer, such as Basyntan WL Liquid, should be easily accessible to employees working with products containing the chemical.

14. MATERIAL SAFETY DATA SHEET

The Material Safety Data Sheet for Basyntan WL Liquid (Attachment 1) was provided in Worksafe Australia format (9). This MSDS was provided by BASF 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 BASF Australia Ltd.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under *the Industrial Chemicals (Notification and Assessment)* Act 1989 as amended (the Act), secondary notification of Basyntan WL, sodium salt 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

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4. *Structure-Activity Relationships for Biodegr*adation, Draft OECD Environment Monograph No. 68, 1993.
5. *EPA Proposed Revisions to Expand Criteria for Exempting Polymers from Premanufacture Notifi*cation, Chemical Regulation Reporter, February 12 1993, p2226-2247.
6. Australian Standard 1337*-1984 Eye Protectors for Industrial Appli*cations, Standards Association of Australia Publ., Sydney, 1984.
7. Australian Standard 216*1-1978 Industrial Safety Gloves and Mittens (excluding Electrical and Medical* Gloves), Standards Association of Australia Publ., Sydney, 1978.
8. Australian Standard 3765.*1-1990 Clothing for Protection against Hazardous Chemicals Part 1 Protection against General of Specific Ch*emicals, Standards Association of Australia Publ., Sydney, 1990.
9. National Occupational Health and Safety Com*mission, Guidance Note for Completion of a Material Safety et*, 3rd Edition, Australian Government Publishing Service Publ., Canberra, 1991.