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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**Charged Surfactant 2 in Ibis 30F**

This Assessment has been compiled in accordance with the provisions of *the Industrial Chemicals (Notification and Assessment) Act* 1989 (the Act), 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 and Family Services.

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Director  
Chemicals Notification and Assessment

**FULL PUBLIC REPORT****Charged Surfactant in Ibit 30F****1. APPLICANT**

Hoechst Australia Limited of 606 St Kilda Road MELBOURNE VIC 3004 has submitted a limited notification statement with their application for an assessment certificate for the chemical Charged surfactant 2 in Ibit 30F.

**2. IDENTITY OF THE CHEMICAL**

Charged surfactant 2 in Ibit 30F is not known to be hazardous based on the limited data provided. Therefore the chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data, details of the chemical composition, exact import volume and customers have been exempted from publication in the Full Public Report and the Summary Report.

<b>Trade Name:</b>	Ibit 30F (commercial product < 5% notified chemical)
<b>Other Names:</b>	alicyclic amine derivatives
<b>Method of Detection and Determination:</b>	infrared (IR) spectroscopy

**3. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance at 20°C and 101.3 kPa:</b>	dark brown liquid
<b>Freezing Point:</b>	-3°C (commercial product Ibit 30F)
<b>Specific Gravity:</b>	0.978
<b>Vapour Pressure:</b>	similar to water (commercial product Ibit 30F)
<b>Water Solubility:</b>	not determined (see below)
<b>Partition Co-efficient (n-octanol/water):</b>	not determined (see below)
<b>Hydrolysis as a Function of pH:</b>	not determined (see below)

<b>Adsorption/Desorption:</b>	not determined (see below)
<b>Dissociation Constant:</b>	not determined (see below)
<b>Flash Point:</b>	not determined (commercial product Ibit 30F is not flammable)
<b>Flammability Limits:</b>	not determined
<b>Autoignition Temperature:</b>	estimated to be > 100°C
<b>Explosive Properties:</b>	not determined
<b>Reactivity/Stability:</b>	stable at ambient temperature and atmospheric pressure

### Comments on Physico-Chemical Properties

The imported chemical product Ibit 30F, containing the notified chemical, is a pale brown, transparent liquid. As the notified chemical makes up less than 5% of Ibit 30F's composition, the vapour pressure exerted by the notified chemical is considered to be negligible. Since a considerable proportion of Ibit 30F is comprised of water, the vapour pressure is expected to be similar to that of water.

The notifier claims that the notified chemical is completely soluble in water. It is expected that the notified chemical will display high water solubility based on its chemical structure and expected surfactant properties. The notifier also claims that the imported chemical product is completely water soluble.

The notifier expects that the notified chemical, being a salt, would "hydrolyse" in the pH range 4-9. However, only the anion component of the notified chemical could hydrolyse. The cation component would be relatively stable to hydrolysis in the environmental pH range.

It is expected that due to its high water solubility the notified chemical would have a very low partition coefficient, though this would be difficult to measure due to its expected surfactant properties and dissociation (1). However, it may bind to soil particles and organic fractions due to the surfactant nature (2).

It is likely that the notified chemical would exhibit a high level of dissociation in the environment as it is a salt.

## 4. PURITY OF THE CHEMICAL

<b>Degree of Purity:</b>	very high
<b>Toxic or Hazardous Impurities:</b>	none

## **5. USE, VOLUME AND FORMULATION**

The notified chemical will not be manufactured in Australia but will be imported as a component of an acid corrosion inhibitor Ibit 30F, for use in chemical cleaning of boiler wall tubes and super heater tubes. The inhibitor (Ibit 30F) strength used in the end use cleaning fluid is less than 0.01% of the notified chemical.

It is estimated that less than one tonne of the notified chemical will be imported in each of the first three years and then the quantity will significantly decrease for the following two years.

## **6. OCCUPATIONAL EXPOSURE**

Ibit 30F, containing less than 5% of the notified chemical, is supplied in 180 kg drums. It will be transported from the waterfront to the notifier by road. Occupational exposure during transfer from the docks to the notifier's warehouse will only occur in the unlikely event of an accident.

At the customer location, Ibit 30F will be unloaded by one forklift truck driver, and exposure is only likely to occur in the event of accidental spillage. The product containing the notified chemical will be transferred to formulation tanks by the use of a drum pump and hose. When the end use cleaning fluid is being formulated there is the potential for dermal exposure during the connecting/disconnecting of hoses. There is also the potential for dermal exposure during process sampling. The formulated solution will be handled by only one person during process sampling.

During its use, the solution will circulate in the boiler. The cleaning fluid will contain the notified chemical at less than 0.01% and will be used in an enclosed system to prevent occupational exposure. After its use, the solution will not normally be handled or contacted.

## **7. PUBLIC EXPOSURE**

The product containing the notified chemical is only for industrial use in power stations. If accidental spillage occurs the notified chemical will be removed by liquid binding and placed in containers for disposal as detailed in the Material Safety Data Sheet (MSDS). No public exposure is expected to occur during transport or use in power stations.

## **8. ENVIRONMENTAL EXPOSURE**

### **Release**

The notified chemical should only be released when used in the cleaning of boilers at power stations. The notifier anticipates that less than 50 kg of the notified chemical will be used at each customer site over the next five years.

The notifier claims that the cleaning fluid, containing the notified chemical at a concentration of less than 0.01%, may be combusted in adjacent boilers. Otherwise, the wastes will be drained to on-site ash dams. These dams, which are over 1 000 megalitres in size, are located within the power station property. Discharge from the dams is expected to be either zero, or extremely low, dependent on rainfall. Discharges are regulated by licences issued by the State Authority. Depending on the age of the dams, effluent may be directed to local streams and creeks. However, this will usually only take place after the waste has been held in the dams for a number of months, or even years. The notifier claims that the dam levels are usually reduced before the inclusion of the waste.

Empty drums containing residues of the notified chemical will be sent to a drum recycler, who will either dispose of the drums or prepare them for re-use. All material not used during normal operations will be retained in sealed containers for later use.

### **Fate**

It is anticipated that at some sites the notified chemical will be incinerated and thus released to the atmosphere. Products of incineration are expected to include water and oxides of carbon, nitrogen and sulphur.

Notified chemical that is released to ash dams is expected to bind with the solid fractions in the dam. The charged surfactant sorbs rapidly and strongly to natural sediments, clay and minerals, including sulfides, oxides and sulfates (2).

Slow degradation may occur (2). The notifier expects the notified chemical to totally biodegrade in the dams but has not provided supporting information. If the notified chemical is released to aquatic environments, it is expected to bind with the dissolved organic carbon (DOC) in the water (3). Charged surfactants that are not readily biodegraded are also expected to partition to sediments following release to surface waters, but their ultimate fate is not well understood (2).

## **9. EVALUATION OF TOXICOLOGICAL DATA**

No toxicological data were provided which is acceptable for chemicals with import volumes of less than one tonne per annum according to the Act.

## **10. ASSESSMENT OF ENVIRONMENTAL EFFECTS**

No ecotoxicological data were provided which is acceptable for chemicals with import volumes of less than one tonne per year according to the Act.

The notified chemical is a charged surfactant and is known to be highly toxic to algae (during acute exposure), and fish and aquatic invertebrate (during chronic exposure) (3). Charged surfactants are known to damage the respiratory membranes of aquatic organisms, and are most toxic when there are 16 or 17 carbons in a linear alkyl chain (4). Therefore, the notified chemical may be expected to display considerable toxicity to aquatic organisms. However, toxicity would be mitigated by the presence of suspended solids, etc (see text below).

## **11. ASSESSMENT OF ENVIRONMENTAL HAZARD**

The major environmental hazard posed by the use of the notified chemical is in the case of inappropriate handling or accidents that release quantities of the chemical in the environment. Adequate control procedures are outlined in the MSDS.

It is anticipated that the majority of notified polymer contained in the cleaning fluid will be either combusted in adjacent boilers or drained to on-site ash dams at the power station sites after the cleaning process. Incineration products are not expected to pose a significant hazard to the environment.

Less than 50 kg of the notified chemical is to be used at each power station. Therefore, the notifier claims that a maximum concentration of the chemical that can potentially be released from the dam will therefore be less than 50 ppb (50 kg into 1 000 ML volume dam). However, the liquid content of the ash dams will be considerably less than 1 000 ML (5). Therefore, the actual concentration of the chemical in the dam could potentially be higher. However, the notifier has indicated that releases from the ash dams are “expected to be either zero or extremely low” and “regulated via a discharge licence”. Also, the actual concentration of the notified chemical may be significantly lower than that calculated above due to biological degradation in the ash dams.

It is expected that the notified polymer will also bind with the solid fractions in the dam (2). This will lead to a decrease in the amount of chemical available for release to the waterways. It is expected that any chemical released will bind with DOC and sediments present in the water column, thus mitigating the toxicity (2, 3). If there is such a release, combined with the fact that only small quantities of the chemical will be used at each site, the environmental hazard should not be significant.

## **12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS**

The occupational health risk for transport and warehouse workers is negligible given the very low percentages of Charged surfactant 2 in the imported product, Ibit 30F and the unlikely event of exposure during normal conditions of storage and handling.

Toxicological data were not supplied for this notification in accordance with the Act. As the molecular weight of the notified chemical is below 1 000 there is the potential for transfer across biological membranes and charged surfactants are likely to cause irritant effects. As the notified chemical is present in low concentrations in the imported product (< 5%) and end use product (< 0.01%) it is unlikely to be of significant toxicological concern in these forms (see comments on the imported product below).

Ibit 30F, containing the notified polymer, will be formulated to produce a cleaning fluid. There is the potential for dermal exposure to the notified chemical during formulation sampling and when workers are connecting/disconnecting hoses during formulation. Ocular exposure is only likely to occur in the event of accidental splashing.

The notifier states that the cleaning fluid, containing the notified polymer at below 0.01% will be handled by one person only at each of the customer sites. During its use in power stations etc., the cleaning fluid will be in an enclosed system, thus preventing worker exposure. Given the low concentration of the notified chemical in the final product and the limited potential for exposure it presents low occupational risk.

Workers should be aware that Ibit 30F is classified as hazardous by the Worksafe Australia criteria (6). It is considered to be harmful by ingestion and may cause irreversible effects (7), on the basis of thiourea present in the product at a concentration below 10%. Other components in the product also have hazardous properties such as skin and eye irritation, therefore exposure to Ibit 30F should be minimised.

There is negligible potential for public exposure to the notified chemical during its use in power stations. The product will not be sold to the public and is therefore not considered to present a risk to the public during normal conditions of use and disposal.

## **13. RECOMMENDATIONS**

To minimise occupational exposure to Charged surfactant 2 in Ibit 30F the following guidelines and precautions should be observed:

- It is good work practice to wear industrial clothing which conforms to the specifications detailed in Australian Standard (AS) 2919 (8) and occupational footwear which conforms to Australian and New Zealand Standard (AS/NZS) 2210 (9) to minimise exposure when handling any industrial chemical;

- Spillage of products containing the notified chemical should be avoided, spillages should be cleaned up promptly with liquid binding which should then be put into containers for disposal;
- Good personal hygiene should be practised to minimise the potential for ingestion; this is particularly important when handling the product Ibit 30F;
- A copy of the MSDS should be easily accessible to employees.

When handling the product Ibit 30F, additional precautions should be taken to minimise exposure given the hazardous nature of the product (see the product MSDS).

#### **14. MATERIAL SAFETY DATA SHEET**

The MSDS for the product containing the notified chemical was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (10).

This MSDS was provided by the applicant as part of the notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of the applicant.

#### **15. REQUIREMENTS FOR SECONDARY NOTIFICATION**

Under the Act, secondary notification of the notified chemical shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. This includes if the notifier proposes to increase the use of the notified chemical to other sites within Australia that employ different discharge practices. No other specific conditions are prescribed.

#### **16. REFERENCES**

1. Organisation for Economic Co-operation and Development 1981 & 1995, *OECD Guidelines for Testing of Chemicals: Partition Coefficient (n octanol/water)*, Flask shaking method, vol. Number 107, OECD, Paris.
2. de Oude, N. 1992, *The Handbook of Environmental Chemistry*, Part F, Anthropogenic Compounds: Detergents, vol. 3, Springer Verlag, Berlin.
3. Nabholz, J.V., Miller, P. & Zeeman, M. 1993, 'Environmental Risk Assessment of New Substances under the Toxic Substances Control Act Section Five', in *Environmental Toxicology and Risk Assessment*, American Society for Testing and Materials, ASTM STP 1179, Philadelphia, pp. 40-55.



4. Clements, R.G., Nabholz, J.V., Johnson, D.W. & Zeeman, M. 1993, *The Use and Application of QSARs in the Office of Toxic Substances for Ecological Hazard Assessment of New Chemicals*, *Environmental Toxicology and Risk Assessment*, American Society for Testing and Materials, ASTM STP 1179, Philadelphia, 56-64.
5. Hartington, R., Personal Communication, Queensland.
6. National Occupational Health and Safety Commission 1994, *Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1994)]*, Australian Government Publishing Service, Canberra.
7. National Occupational Health and Safety Commission 1994, *List of Designated Hazardous Substances [NOHSC:10005(1994)]*, Australian Government Publishing Service, Canberra.
8. Standards Australia 1987, *Australian Standard 2919-1987, Industrial Clothing*, Standards Association of Australia, Sydney.
9. Standards Australia/Standards New Zealand 1994, *Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear*, Standards Association of Australia/Standards Association of New Zealand, Sydney/Wellington.
10. National Occupational Health and Safety Commission 1994, *National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]*, Australian Government Publishing Service, Canberra.