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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

ADDITIVE IN TITANATE R.18.046

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

ADDITIVE IN TITANATE R.18.046

1. APPLICANT

Sika Australia of 55 Elizabeth St WETHERILL PARK NSW 2164 has submitted a limited notification statement in support of their application for an assessment certificate for Additive in Titanate R.18.046.

2. IDENTITY OF THE CHEMICAL

Additive in Titanate R.18.046 is not considered to be hazardous based on the nature of the chemical and the data provided. Therefore the chemical name, CAS number, molecular and structural formulae and import volume have been exempted from publication in the Full Public Report and the Summary Report.

Trade name:	Titanate R.18.046 (> 80% notified chemical in isopropanol)
Molecular weight:	> 1 000
Method of detection and determination:	infrared spectroscopy

3. PHYSICAL AND CHEMICAL PROPERTIES

The notified chemical is manufactured in isopropanol and is not isolated. The following physico-chemical properties are for the notified chemical in isopropanol.

Appearance at 20°C and 101.3 kPa:	reddish-brown liquid
Boiling point:	not determined, expected to be very high
Specific gravity:	1.075
Vapour pressure:	42.7 kPa 20°C (isopropanol)
Water solubility:	insoluble in water; can be made soluble in water, but only after emulsification with surfactants; water solubility not determined.

Partition co-efficient (n-octanol/water):	not determined; expected to partition completely into the octanol phase
Hydrolysis as a function of pH:	insoluble in water
Adsorption/desorption:	expected to react irreversibly with silicates
Dissociation constant:	notified chemical is insoluble in water and does not contain any groups which will undergo dissociation.
Flash point:	12°C (TCC) (isopropanol)
Flammability limits:	L.E.L. = 2.5% (isopropanol)
Autoignition temperature:	455.6°C (isopropanol)
Explosive properties:	not explosive
Reactivity/stability:	the notified chemical is generally stable, but is not compatible with oxidising or reducing agents, acid or alkaline material

Comments on Physico-Chemical Properties

The notifier has stated that the chemical has been designed to slowly cross-link in the presence of moisture. Literature supports the reactivity of a similar titanate in the presence of water (1). Therefore, water solubility would be difficult to determine.

Partition coefficient was not determined, however, the notifier expects the notified chemical to partition completely into the octanol phase, suggestive of low water solubility. Again this would be difficult to determine.

No measurement of hydrolysis, adsorption/desorption or dissociation constant was made, due to the insoluble and/or reactive nature of the chemical. The notifier expects it to adsorb strongly with silicates (no reason is given), and it is not expected to dissociate under environmental conditions.

4. PURITY OF THE CHEMICAL

Degree of purity:	99%
Toxic or hazardous impurities:	none
Non-hazardous impurities (> 1% by weight):	none

Additives/Adjuvants:		the notified chemical is manufactured in isopropanol and is not isolated
	Chemical name:	isopropanol
	Synonyms:	isopropyl alcohol
	CAS No.:	67-63-0
	Weight percentage:	< 20%

5. USE, VOLUME AND FORMULATION

The notified substance will not be manufactured in Australia. Annual import volume is expected to be less than 1 000 kg/year for the first 5 years. It will be imported as a component of two products: Titanate R.18.046 (> 80% notified chemical, < 20% isopropanol) and as a 5% solution.

Titanate R.18.046 is a coupling agent, which will be reformulated locally to make a 5% solution. This solution will be used as an adhesion promoter for polyurethane adhesives. The adhesives will be used in transport vehicles.

6. OCCUPATIONAL EXPOSURE

The notified chemical will be imported in either 250 mL or 1 L metal cans of finished 5% solution, or as the concentrate, Titanate R.18.046. The cans will be shipped in cartons containing 6 cans. These cartons are stored in multiwall fibre board boxes which are palletised and wrapped in plastic.

Waterside workers will unload shipping containers containing cans of the titanate and load them onto trucks for road transport to a warehouse facility. The products will either be stored and distributed locally, or transported by road to warehouses interstate. Warehouse workers will unpack boxes and distribute the cartons to customer sites. Exposure of warehouse, transport and waterside workers will only occur if the cans leak or in the event of an accident.

The concentrate, Titanate R.18.046, will be reformulated in Australia. Reformulators will be required to open a drum and mechanically pump out a small amount to allow space for mixing. Titanate R.18.046 will be manually added to this drum, and the mixture will then be stirred using a mechanical stirrer. Dermal and inhalational exposure to the notified chemical and isopropanol may occur during these processes, and ocular contact from splashes may also occur. The notifier has indicated that these processes will be carried out under local and general exhaust ventilation. The drum is then relocated to the filling area, and connected by a hose to a filling machine, which automatically fills and seals the containers in an enclosed system. Reformulation will take place for an estimated 4 hours/day, 4 days/year. As the filling process is automatic, worker exposure is expected to be low, although some contact with the notified chemical may occur during cleaning of the filling

equipment.

Applicators will be exposed to the notified chemical for an estimated half an hour a day, 200 days/year. Dermal and inhalational exposure may occur during application, although the levels of the notified chemical will be relatively low (< 5%).

7. PUBLIC EXPOSURE

The notified chemical will not be available for use by the public. Minimal exposure may occur if the automobile is damaged, accidentally exposing the areas covered by the notified chemical. However, the notified chemical will be covered by sealant/adhesive, and therefore should pose negligible hazard to the public.

Minor public exposure may result from disposal of the notified chemical during formulation, or accidental spillage during transport and storage. However, adequate measures are described by the notifier to minimise the risk of public exposure during disposal, reformulation or in the event of accidental spillage.

8. ENVIRONMENTAL EXPOSURE

Release

The notifier states that in a worst case scenario, approximately 16.8 kg/y of the notified chemical will be released to the environment. The majority of this will be through formulation (12 kg/y), with the remainder lost through leaking cans, accidental spills and during application.

Risk of environmental exposure during transport is limited to incidents involving accident or leaking cans.

Release to the environment through reformulation may occur as a result of residual material remaining in cans of the concentrate Titanate R.18.046. This material will be allowed to cross-link and solidify. The concentrate may also be released during the cleaning of equipment. The cleaning process will be carried out using a small quantity of a suitable solvent. Waste generated from the residual in cans and the cleaning process will be disposed of to landfill by a licensed contractor.

Application equipment will be disposed of as trade waste by a licensed contractor.

Fate

The notified chemical is expected to be used in a polyurethane adhesives systems in vehicles and will remain with the jointed surfaces until it is removed or disposed of with the articles to which it is bound. Therefore most of notified chemical manufactured will be incorporated in a polymer matrix, most of which will eventually be disposed of by landfill.

A small amount of waste is generated during application. The fate of this waste was not given by the applicant, however, it is expected to eventually go to landfill or possibly be incinerated.

The greater portion of the notified chemical is not expected to be released to the environment until it has been fully cured into a solid matrix. The resultant matrix structure should limit the hydrolysis or biodegradation of the chemical. Bioaccumulation of the chemical is unlikely due to the high molecular weight (> 1 000), even before curing. Leaching from landfill sites is not expected as the notified chemical is a chemical with low water solubility. In the presence of moisture, the notified chemical will slowly cure and solidify.

9. EVALUATION OF TOXICOLOGICAL DATA

According to the Act, toxicological data are not required for chemicals with an import volume of less than 1 000 kg per year, and no data were submitted for this chemical.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

According to the Act, environmental effects testing is not required for chemicals with an import volume of less than 1 000 kg per year, and no data were submitted for this chemical.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

On account of the low import volume of the notified chemical the environmental exposure during transport will be very limited.

Use of the notified chemical is not expected to release significant amounts of the notified chemical to the environment, due to the nature of the product and method of application. On exposure to ambient conditions, the notified chemical is expected to cure to an inert solid, which will prevent any release of the notified chemical to the environment.

In landfill the notified chemical is not expected to leach. The environmental hazard from the disposal of vehicles which contain the cured chemical by landfill is rated as negligible.

The overall environmental hazard can be rated as negligible.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

Information provided by the notifier on the Material Safety Data Sheet (MSDS) indicates that breakdown products of Titanate R.18.046 may be moderately toxic if ingested, moderately irritating to the skin and upper respiratory tract, and potentially severely irritating to the eyes. A similar titanate is a mild skin irritant and a moderate eye irritant in rabbits. Hence the notified chemical in the concentrated form is likely to cause irritation if exposure to the skin, eyes or respiratory system occurs. In addition, Titanate R.18.046 and the reformulated product both contain isopropanol, which is also a moderate to severe eye irritant and a mild skin irritant.

The occupational health risk posed by the notified chemical to waterside, warehouse and transport workers is negligible, particularly considering the low import volume. These workers are only likely to come into contact with the notified chemical in the event of leaking packaging or accident.

A moderate occupational health risk will be posed to reformulators, who may be exposed to the notified chemical and isopropanol. Dermal, inhalational and ocular contact may occur during this process, which could result in irritation to the eyes, skin and respiratory tract. Exposure to the chemical is expected to be intermittent (4 hours/day, 4 days/year) and the amount of the concentrate handled by workers is expected to be relatively small. The notifier states that the risk will be minimised by reformulators wearing respiratory and eye protection, gloves and protective clothing, and working under local and general exhaust ventilation.

As the filling process is largely enclosed and automatic, minimal exposure to workers is expected to occur, and hence the occupational risk is low, although workers may be exposed to the notified chemical during cleaning and maintenance of equipment.

It is possible that dermal and inhalational irritation may occur during application of the notified chemical. However, the concentration of the notified chemical in the end use product is less than 5%, below the concentration cut offs listed in *The Approved Criteria for Classifying Hazardous Substances* (2) for skin, eye and respiratory irritants. Due to the low concentration of the notified chemical in the product and the relatively short exposure times, the occupational health risk is low. Eye contact is expected to be limited to drips and splashes.

The notified chemical will be used in transport vehicles and will not be available to the public. Minimal public exposure may result following accidental damage to the vehicle, however the chemical will be bound in a three-dimensional polymer matrix, and as such would pose negligible public health risk. The potential for minor public exposure exists during transport, disposal or reformulation of the chemical if accidentally spilt. This is minimised by the recommended practices during storage, reformulation and transportation.

13. RECOMMENDATIONS

To minimise occupational exposure to Additive in Titanate R.18.046 the following guidelines and precautions should be observed when workers may be exposed to a concentrated solution of the notified chemical in isopropanol:

- Safety goggles should be selected and fitted in accordance with Australian Standard (AS)1336 (3) to comply with Australian/New Zealand Standard (AS/NZS) 1337 (4);

- Industrial clothing should conform to the specifications detailed in AS 2919 (5) should be worn;

- Impermeable gloves or mittens conforming to AS 2161 (6) should be used;

- A mask which conforms with AS/NZS 1715-1994: *Use and Maintenance of Respiratory Protective Devices* (7) and AS/NZS 1716-1991: *Respiratory Protective Devices* (8) should be selected and fitted if ventilation is inadequate.

The following recommendations should be applied whenever workplace exposure to the notified chemical (at any concentration within formulations) may occur:

- Spillage of the notified chemical should be avoided, spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;

- Good personal hygiene should be practised to minimise the potential for ingestion;

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

In addition, the Worksafe Australia document *Exposure Standards for Atmospheric Contaminants in the Occupational Environment: Guidance Note and National Exposure Standards* (9) should be used as a guide in the control of workplace exposure to isopropanol and appropriate personal protective equipment should be worn where necessary to minimise exposure to this potentially irritating chemical.

14. MATERIAL SAFETY DATA SHEET

The MSDS for 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. No other specific conditions are prescribed.

16. REFERENCES

1. Windholz, M. and Budavari, S. (eds) 1989, *The Merck Index (11th Ed)* Merck, New Jersey.

2. National Occupational Health and Safety Commission 1994, *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)], Australian Government Publishing Service, Canberra.

3. Standards Australia 1994, *Australian Standard 1336-1994*, *Eye protection in the Industrial Environment*, Standards Association of Australia Publ., Sydney.

4. Standards Australia/Standards New Zealand 1992, *Australian/New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney, Standards Association of New Zealand Publ, Wellington.

5. Standards Australia 1987, *Australian Standard 2919-1987, Industrial Clothing,* Standards Association of Australian Publ., Sydney.

6. Standards Australia 1978, *Australian Standard 2161-1978, Industrial Safety Gloves and Mittens (excluding electrical and medical gloves),* Standards Association of Australia Publ., Sydney.

7. 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, Standards Association of New Zealand Publ, Wellington.

8. Standards Australia/Standards New Zealand 1994, *Australian/New Zealand Standard 1716-1994, Respiratory Protective Devices,* Standards Association of Australia Publ., Sydney, Standards Association of New Zealand Publ, Wellington.

9. National Occupational Health and Safety Commission 1995, 'Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment', [NOHSC: 1003(1995)], in *Exposure Standards for Atmospheric Contaminants in the Occupational Environment: Guidance Note and National Exposure Standards*, Australian Government Publishing Service Publ., Canberra.

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.