3(2H)-Isothiazolone, 2-octyl-: Human health tier II assessment

08 March 2019

CAS Number: 26530-20-1

Preface

This assessment was carried out by staff of the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) using the Inventory Multi-tiered Assessment and Prioritisation (IMAP) framework.

The IMAP framework addresses the human health and environmental impacts of previously unassessed industrial chemicals listed on the Australian Inventory of Chemical Substances (the Inventory).

The framework was developed with significant input from stakeholders and provides a more rapid, flexible and transparent approach for the assessment of chemicals listed on the Inventory.

Stage One of the implementation of this framework, which lasted four years from 1 July 2012, examined 3000 chemicals meeting characteristics identified by stakeholders as needing priority assessment. This included chemicals for which NICNAS already held exposure information, chemicals identified as a concern or for which regulatory action had been taken overseas, and chemicals detected in international studies analysing chemicals present in babies' umbilical cord blood.

Stage Two of IMAP began in July 2016. We are continuing to assess chemicals on the Inventory, including chemicals identified as a concern for which action has been taken overseas and chemicals that can be rapidly identified and assessed by using Stage One information. We are also continuing to publish information for chemicals on the Inventory that pose a low risk to human health or the environment or both. This work provides efficiencies and enables us to identify higher risk chemicals requiring assessment.

The IMAP framework is a science and risk-based model designed to align the assessment effort with the human health and environmental impacts of chemicals. It has three tiers of assessment, with the assessment effort increasing with each tier. The Tier I assessment is a high throughput approach using tabulated electronic data. The Tier II assessment is an evaluation of risk on a substance-by-substance or chemical category-by-category basis. Tier III assessments are conducted to address specific concerns that could not be resolved during the Tier II assessment.

These assessments are carried out by staff employed by the Australian Government Department of Health and the Australian Government Department of the Environment and Energy. The human health and environment risk assessments are conducted and published separately, using information available at the time, and may be undertaken at different tiers.

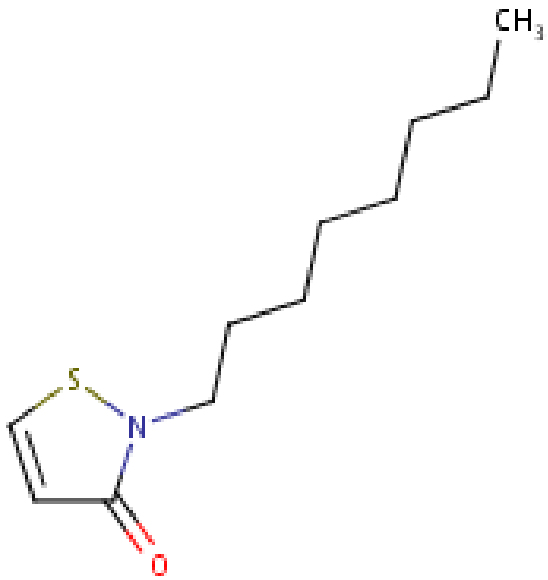
This chemical or group of chemicals are being assessed at Tier II because the Tier I assessment indicated that it needed further investigation.

For more detail on this program please visit:www.nicnas.gov.au

Disclaimer

Acronyms & Abbreviations

Chemical Identity

Synonyms	octhilinone octylisothiazolinone OIT 2-octyl-3(2H)-isothiazolone 2-octyl-4-isothiazolin-3-one
Structural Formula	
Molecular Formula	C11H19NOS
Molecular Weight (g/mol)	213.34
SMILES	C1(=O)C=CSN1CCCCCCCC

Import, Manufacture and Use

Australian

The following commercial uses have been identified through websites and safety data sheets (SDSs) available in Australia:

- timber coatings and primers;
- inks; and
- sealing agents.

According to industry information, the chemical has domestic use in architectural paints and in decking oils at concentrations of 0.02% and up to 0.11%, respectively.

The chemical is used as an approved active constituent by the Australian Pesticides and Veterinary Medicines Authority (APVMA) (APVMA, 2014).

International

The following international uses have been identified through the European Union (EU) Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) dossier; the European Commission Cosmetic Ingredient (CosIng) database; Galleria Chemica; the United States (US) National Library of Medicine's Haz-Map; the US National Library of Medicine's Household Products Database (US HPD); the Personal Care Products Council International Nomenclature of Cosmetic Ingredients (INCI) Dictionary; the US National Toxicology Program (NTP); and the Substances and Preparations in Nordic countries (SPIN) database.

The chemical has reported cosmetic uses as an antibacterial agent in shampoo and other cosmetics. The chemical has been reported to be present in tattoo inks.

The chemical has reported domestic uses for home maintenance in:

- polishes, paints, lacquers, and coatings;
- surface treatment agents; and
- adhesives and binding agents.

Use concentrations were typically reported to be <1 % in paints but concentrations up to 10 % were reported in adhesive products.

The chemical has reported commercial uses as a biocide and preservative in:

- disinfectants and cleaning agents;
- colouring agents;
- pigment pastes;
- toners;
- filling agents;
- proofing agents;
- caulking compounds;
- impregnation materials;

- softeners;
- reprographic agents;
- leather tanning and processing;
- cooling agents for metal machining;
- rinsing agents for textiles;
- cement, concrete and mortar;
- fibre, leather, rubber and polymerised materials; and
- wood, pulp and paper products.

The chemical has reported site-limited uses in surface treatment for paper, cardboard and non-metals.

The chemical has reported non-industrial uses in non-agricultural pesticides and preservatives.

Restrictions

Australian

The chemical is listed in the *Poisons Standard—the Standard for the Uniform Scheduling of Medicines and Poisons* (SUSMP) in Schedule 6 (SUSMP, 2018).

OCTHILINONE except in paints, jointing compounds and sealants containing 1 per cent or less of octhilinone calculated on the non-volatile content.

Schedule 6 chemicals are described as 'Poison – Substances with a moderate potential for causing harm, the extent of which can be reduced through the use of distinctive packaging with strong warnings and safety directions on the label (SUSMP, 2018).

International

No known restrictions have been identified.

Existing Work Health and Safety Controls

Hazard Classification

The chemical is classified as hazardous, with the following hazard categories and hazard statements for human health in the Hazardous Chemicals Information System (HCIS) (Safe Work Australia):

- Acute Toxicity Category 3, H331 (Toxic if inhaled)
- Acute Toxicity Category 3, H311 (Toxic in contact with skin)
- Acute Toxicity Category 4, H302 (Harmful if swallowed)
- Skin Corrosion Category 1B, H314 (Causes severe skin burns and eye damage)

- Skin Sensitisation Category 1, H317 (May cause an allergic skin reaction)

Exposure Standards

Australian

No specific exposure standards are available.

International

The following exposure standards are identified (Galleria Chemica; CCOHS RTECS).

Switzerland:

- Maximum workplace concentration value (MAK) = 0.05 mg/m^3
- Short Time Limit value = 0.1 mg/m^3

Austria:

- MAK daily average value (TMW) = 0.05 mg/m^3

The Netherlands:

- Maximum exposure limits (MAC-TGG) = 0.05 mg/m^3

Health Hazard Information

Toxicokinetics

Based on oral and dermal administration studies in Wistar rats, Sprague-Dawley (SD) rats, and guinea pigs, the chemical is rapidly and extensively absorbed (up to 70 %) following single or repeated exposure. Absorption by the dermal route is less extensive (40 % of a non-irritant concentration absorbed) (ECHA, 2018).

The chemical is widely distributed throughout the body. Metabolism occurs both systematically and by the gastrointestinal tract, via cleavage of the sulfur-nitrogen bond (ECHA, 2018).

Excretion is through the biliary and urinary routes, with almost complete elimination by 96 hours. The chemical and its metabolites were shown to have limited potential for bioaccumulation on repeated exposure (ECHA, 2018).

Acute Toxicity

Oral

The chemical is classified as hazardous, with hazard category Acute Toxicity Category 4 and hazard statement ‘Harmful if swallowed’ (H302) in the HCIS (Safe Work Australia). The available data (median lethal dose—LD50—125 mg/kg bw) indicate that a change in the classification to Acute toxicity category 3 is appropriate (see **Recommendation** section).

In a study conducted in accordance with the Organisation For Economic Co-operation and Development (OECD) Test Guideline (TG) 401, male and female rats (strain and number not specified) were given the chemical orally (unspecified). The LD50 was 125 mg/kg bw (REACH). In a similar study, the chemical (45 %) in propylene glycol was administered to male and female Sprague Dawley (SD) rats at doses of 0, 90, 180 or 450 mg/kg bw. The reported LD50 value was 125 mg/kg bw for both sexes. Clinical signs included central nervous system (CNS) depression, decreased respiratory rate, pallor of the extremities and piloerection. No abnormal findings during gross necropsy were detected (ECHA, 2018).

In another study based on OECD TG 401, rats (strain, sex and number not specified) were given the chemical orally. The reported LD50 was 550 mg/kg bw (CCOHS RTECS; Galleria Chemica).

In a study, male and female rats were treated by oral gavage with the chemical (42–46.7 %) in propylene glycol at doses of 0, 126, 210, 336, 504 or 840 mg/kg bw. Clinical signs observed were (CNS) depression, distended stomachs, pale extremities, respiratory noise, cool-to-touch, lacrimation, scant droppings, diarrhoea, red-stained muzzle and stained anogenital area. Gross necropsy revealed redness of the stomach and intestinal mucosa and/or yellow or white fluid-filled stomach or intestines in the decedents. The LD50 values were 318 mg/kg bw (males) and 324 mg/kg bw (females) (ECHA, 2018).

A non-guideline study in rats reported an LD50 of 247 mg/kg bw (males) and 292 mg/kg (females) (ECHA, 2018).

In other studies, the LD50 values for acute oral toxicity was 794 and 681 mg/kg for males and females, respectively (no study details given) (US EPA, 2007).

Dermal

The chemical is classified as hazardous, with hazard category Acute Toxicity Category 3 and hazard statement ‘Toxic in contact with skin’ (H311) in the HCIS (Safe Work Australia). The available data (LD50—311 mg/kg bw) support this classification.

In a similar study, the chemical (42–46.7 %) in propylene glycol was applied to shaved, intact skin of male albino rabbits (5/dose group) at dose levels of 146, 291, 582, 1163 or 2326 mg/kg bw for 24 hours under semi-occlusive conditions. All animals treated with doses of ≥582 mg/kg bw died. Clinical signs (lethargy, prostration, ataxia and partial paresis of hind limbs) were observed in animals treated with ≥291 mg/kg bw. The local treatment area had signs of severe erythema and oedema during the experiment, followed by eschar formation which preceded death. Necropsy of surviving animals at 291 mg/kg bw revealed irregular-shaped spleens. The reported dermal LD50 was 311 mg/kg bw (ECHA, 2018; REACH).

In another study, the LD50 for administration onto rabbit (strain and sex not specified) skin was reported as 690 mg/kg bw (CCOHS RTECS; Galleria Chemica).

In another dermal study, a single dose of 900 mg/kg bw of the chemical (45 % in propylene glycol) was applied under occlusive conditions to the shaven intact skin of male and female rabbits (5/sex) for 24 h. No deaths, clinical signs of systemic toxicity or macroscopic abnormalities were observed at necropsy. Oedema (slight to well-defined) was observed at application sites on day 2. Localised severe damage to the skin, associated with severe oedema and scabbing developed over the next few days. Skin healing occurred on day 10 (post-application). The dermal LD50 was >900 mg/kg bw (ECHA, 2018).

Inhalation

The chemical is classified as hazardous, with hazard category Acute Toxicity Category 3 and hazard statement ‘Toxic if inhaled’ (H331) in the HCIS (Safe Work Australia). The available data (median lethal concentration—LC50—0.27 mg/L) indicate that a change in the classification to Acute Toxicity Category 2 is appropriate (see **Recommendation** section).

In a study conducted in accordance with OECD TG 403, rats were exposed (nose-only) to an aerosolised form of the chemical (42–46.7 % in propylene glycol) for 4 hours, at concentrations of 0.058, 0.095, 0.229 or 0.671 mg/L. The LC50 was 0.58 mg/L. Clinical signs included sensory and upper respiratory irritation (dyspnoea, bradypnoea, rales, gasping), and CNS depression (ataxia, listlessness, prostration) which was considered secondary to respiratory distress and nasal mucosal irritation. Red/brown foci and brown areas on the lungs and oedematous tongues were observed in decedents (ECHA, 2018).

In another study (OECD TG 403), rats were exposed (whole-body exposure) to the chemical (45 %) in propylene glycol for 4 hours, using concentrations of 0.115, 0.224 or 0.330 mg/L. The combined LC50 for males and females was 0.27 mg/L, with most deaths occurring in the first 24 h period after exposure. Clinical signs included gasping, disturbed respiration, immobility

and staining of the fur. Gross necropsy of decedents revealed congestion of the lungs, gas-filled stomachs and increased lung weight (relative to body weight) in some incidences. No treatment-related abnormalities were observed in surviving animals (ECHA, 2018).

In another study based on OECD TG 403 (acute inhalation toxicity), animal study (sex and species not specified) were exposed to the chemical (liquid vapour) for 4 hours. The LC50 was reported as 270 mg/m^3 (REACH).

The lethal concentration (LC) for inhalation in the rat (strain and sex not specified) has been reported elsewhere as >2000 mg/m^3 (CCOHS RTECS; Galleria Chemica; Haz-Map).

Corrosion / Irritation

Corrosivity

The chemical is classified as corrosive, with hazard category Skin Corrosion Category 1B and hazard statement ‘Causes severe skin burns and eye damage’ (H314) in the HCIS (Safe Work Australia). The available data support this classification. The chemical applied to intact rabbit skin produced severe erythema and oedema that were not reversible and caused severe damage to the rabbit eye.

Skin effects

In an OECD TG 404 (acute dermal irritation/corrosion) study in rabbits (strain and sex not specified), there was a positive indication of irritation (score of 6 out of a maximum score of 8) that was not reversible (REACH).

In a study, the chemical (45–50 % in propylene glycol) (0.5 mL) was applied to the shaven skin of 6 male New Zealand White (NZW) rabbits for 4 hours under occlusive conditions, with observation for 7 days post-exposure. All animals had visible destruction of dermal tissue and severe erythema and oedema was noted from 1 hour. Eschar and blanching persisted in all animals until the end of the study (ECHA, 2018).

In another study, the chemical (45 % in propylene glycol) (0.5 mL) was applied to the shaven skin of 6 female NZW rabbits for 4 hours under semi-occlusive conditions, with observation for 14 days post-exposure. Well-defined erythema with severe oedema was noted at all treatment sites from 30 minutes. At 24 hours, necrosis and chemical burns, with slight to moderate oedema, had developed. Reactions persisted up to day 14 in all but one animal where reactions improved slightly by day 8. This animal showed desquamation of the stratum corneum on days 7 and 8, and hyperkeratosis from day 9 to the end of the study period (ECHA, 2018).

Eye effects

In an OECD TG 405 (acute eye irritation/corrosion) study in rabbits (strain and sex not specified), there was positive indication of irritation (score of 80 out of a maximum score of 110) that was not reversible (REACH). In a standard Draize test, 100 mg of the chemical was administered into the eye of rabbits (strain and sex not specified) which elicited a severe reaction. No other information was provided (CCOHS RTECS; Galleria Chemica).

Respiratory effects

In an inhalation acute toxicity study (see **Acute Toxicity: Inhalation** section), changes in the lung and mucosal irritation were reported, and clinical signs including gasping. Given the nature of these effects, it is likely that the mechanism of toxicity is, at least in part, due to corrosion of the respiratory tract and classification is considered warranted.

Sensitisation

Skin Sensitisation

The chemical is classified as a sensitiser, with hazard category Sensitisation Category 1A and hazard statement 'May cause an allergic skin reaction' (H317). The positive results reported in local lymph node assays (LLNA) (EC3 values of 0.46 %, 0.66 % and 0.24 %), guinea pig maximisation tests (GPMT), and a Buehler test support this classification.

In a LLNA study in mice (stain unspecified), a positive response was reported when the chemical (concentrations of 0, 0.25, 0.5, 1, 2.5 or 5 %) in acetone:olive oil (4:1) was applied to the dorsal surface of both ears on 3 consecutive days. Evidence of irritation (erythema and oedema) was observed at the site of application. The EC3 value was 0.46 % (ECHA, 2018).

The following were observed in two other LLNA mice studies, which had methodological shortcomings (ECHA, 2018):

- a positive response for skin sensitisation, with a stimulation index (SI) >3 at concentrations ≥3000 ppm. The EC3 value was 0.24 %. However, a positive control was not included in this study.
- a positive response for skin sensitisation, with a SI >3 at the highest concentration tested (11250 ppm). The EC3 value was 0.66 %. However, the positive control had a response that was unsatisfactorily low (SI <3), suggesting the test may not have worked properly.

In a non-guideline GPMT the chemical (45 % in propylene glycol) was tested for skin sensitisation. During induction, intradermal injections of 1 % and topical applications of 2.5 % were used. For the topical challenge, concentrations of 0.5 % and 1 % were used. Sensitisation reactions (slight to well-defined erythema, no to slight oedema) were observed in all animals following a challenge concentration of 1 %. Less severe or no reactions were observed after challenge at 0.5 % of the chemical (ECHA, 2018).

In a GPMT, 10/15 guinea pigs (sex and strain not specified) had positive reactions to the chemical. No other information was provided (REACH).

In a Buehler study following OECD TG 406, guinea pigs were treated with the chemical (48 % in propylene glycol) at concentrations of 0, 25, 50, 100, 500, 750, 1200 or 2400 ppm at induction. Challenge concentrations of 100, 750 or 1200 ppm were tested. A positive response was observed following induction at 50 ppm whereby 20 % of animals responded to a challenge concentration of 1200 ppm (ECHA, 2018).

Observation in humans

In an epidemiology study, the results from patch tests with the chemical that were conducted between January 1992 and February 2012 indicated a total of 20 out of 648 patients had positive reactions. Most patients were painters and the majority of the patients with relevant sensitisation responses (90 %) to the chemical had been exposed in occupational settings (Mose et al., 2013).

In a study, the skin sensitisation potential of the chemical was investigated in 6 groups of adult volunteers (total of 74 volunteers). Various concentrations of the chemical in petroleum and Tween-85 were applied daily to the paraspinal area of the back in Finn chambers for 21 days. Approximately 24 hours after each of the daily applications, the patch was removed and the skin left open to the air for 10 minutes. Volunteers with suspected sensitisation reactions received a challenge patch test at a distant skin site. Challenge patches were left in place for 48 hours. Of the 9 volunteers with suspected sensitisation reactions, 6 were confirmed at challenge (ECHA, 2018).

In a study that complied with Title 212 of the code of US Federal investigations, the chemical in water (50 ppm) was used in a series of repeat insult patch tests in 103 adult subjects. The chemical (0.2 mL) was applied by occluded patch to give a dose of 2.5 µg/cm^2 skin. During induction, a fresh patch was applied 3 times per week to the same site, for 3 weeks. Subjects received a challenge application at an adjacent skin site. The challenge patch was removed after 24 hours and scored at 24, 48, 72 and 96 hours post application. No skin reactions were observed (ECHA, 2018).

In another study, 222 volunteers were treated with the chemical in water (100 ppm). The chemical (0.2 mL) was applied by occluded patch to give a dose of 5 µg/cm^2 skin. During the induction phase, a fresh patch was applied to the same site 3 times per week for 3 weeks. After a two week rest period, subjects received a challenge application at an adjacent skin site for 24 hours. The patch was scored at 24 and 72 hours post application. A sensitisation reaction, confirmed by re-challenge, was observed in one volunteer (ECHA, 2018).

Another repeat insult patch test was conducted in 207 volunteers. The chemical in body lotion (100 ppm) was tested using the same induction and challenge application methods and schedule as described previously at a dose of 5 µg/cm^2 skin. Sensitisation reactions were reported at challenge in 3 volunteers (ECHA, 2018).

Airborne allergic contact dermatitis following non-occupational exposures to isothiazolinones in water-based paints has been reported (Lundov et al., 2014; Aerts et al., 2017; Amsler et al., 2017).

Repeated Dose Toxicity

Oral

The available data are not sufficient to make a recommendation on the repeat dose oral toxicity effects of the chemical.

A no observed adverse effect level (NOAEL) of 5 mg/kg bw/day was reported based on systemic effects in maternal rats (mortality, decreased body weight gain, decreased food consumption) in a developmental rat toxicity study provided to the US EPA (US EPA, 2007). No other details are available.

Dermal

The available data are not sufficient to make a recommendation on the repeat dose dermal toxicity effects of the chemical.

The following NOAEL values were reported (US EPA, 2007):

- 10 mg/kg bw/day based on dermal irritation in a 14-day dermal toxicity study in male and female rats (strain and number not specified);
- 5.95 mg/kg bw/day based on systemic effects observed (decreases in haemoglobin, glucose challenge test, red blood cell count, albumin, and total protein and a decrease in body weight gain) in a 90-day dermal toxicity study in rats (strain and number not specified).

No other details are available in these studies.

Inhalation

The available data are not sufficient to make a recommendation on the repeat dose inhalation toxicity effects of the chemical.

In a 90-day inhalation study in rats, a NOAEL of 0.64 mg/m^3 (equivalent to 0.18 mg/kg bw/day) was reported. Effects observed at the lowest adverse observed effect level (LOAEL) of 6.39 mg/m^3 included clinical signs (rales, dyspnoea), decreases in body weight gain, fluid in uterus and pulmonary and nasal cavity pathology (US EPA, 2007).

Genotoxicity

Based on the weight of evidence from available in vitro and in vivo genotoxicity studies, the chemical is not considered to be genotoxic.

The chemical was negative for genotoxicity in several in vitro studies conducted according to OECD TG 471 (bacterial reverse mutation assay). The chemical was negative in Ames (reverse mutation) tests with *Salmonella typhimurium* strains TA97, TA98, TA100, TA1535, TA1537 and TA1538, with and without metabolic activation at concentrations 0.3–1666 µg/plate (REACH).

The chemical was reported to be negative for genotoxicity in a non-guideline in vivo mammalian somatic cell study (species not specified) (REACH).

The chemical was negative, with and without metabolic activation, in the reverse mutation assay with Ames *Salmonella*, in a mouse bone marrow chromosomal aberration test, and in a mammalian cell in culture gene mutation assay (US EPA, 2007).

Carcinogenicity

No data are available for this chemical.

Reproductive and Developmental Toxicity

No data are available for this chemical.

Risk Characterisation

Critical Health Effects

The critical health effects for risk characterisation include systemic acute effects (acute toxicity from oral, dermal, inhalation and ocular exposure), local effects (corrosivity) and systemic effects (skin sensitisation).

Public Risk Characterisation

The available information indicates that the chemical has commercial and domestic uses in Australia. Although use in cosmetic products in Australia is not known, the chemical is reported to be used in cosmetic products overseas (see **Import, Manufacture and Use** section).

Considering the range of domestic, cosmetic and personal care products that may contain the chemical, the main route of public exposure is expected to be through the skin, inhalation from products applied as aerosols, and incidental oral exposure. Given the low concentrations expected for a preservative in these products, health effects apart from skin sensitisation are not expected.

Direct exposure to paint formulations containing the chemical and several other isothiazolinones have resulted in allergic reactions (see **Skin sensitisation: Observation in humans** section). Currently, there are no restrictions in Australia on using the chemical and several other isothiazolinones in paint formulations.

Further characterisation of the risks from the use of the chemical in cosmetic and domestic products is required. Additionally, the risks from the use of the chemical and other isothiazolinones as a preservative in water-based paints formulations should be examined.

In the absence of any regulatory controls, the characterised critical health effect of skin sensitisation has the potential to pose an unreasonable risk under the identified uses.

Occupational Risk Characterisation

During product formulation, oral, dermal, ocular and inhalation exposure might occur, particularly where manual or open processes are used. These could include transfer and blending activities, quality control analysis, and cleaning and maintaining equipment. Worker exposure to the chemical at lower concentrations could also occur while using formulated products containing the chemical. The level and route of exposure will vary depending on the method of application and work practices employed.

Given the critical health effects, the chemical could pose an unreasonable risk to workers unless adequate control measures to minimise oral, dermal, ocular and inhalation exposure are implemented. The chemical should be appropriately classified and

labelled to ensure that a person conducting a business or undertaking (PCBU) at a workplace (such as an employer) has adequate information to determine the appropriate controls.

The data available support an amendment to the hazard classification in the HCIS (Safe Work Australia) (see **Recommendation** section).

In Europe a specific concentration limit (SCL) for the sensitisation classification is being proposed (ECHA, 2018). Further examination of the data is required to recommend a SCL.

NICNAS Recommendation

The chemical is recommended for Tier III assessment to further characterise the risks from the use of octylisothiazolinone in cosmetic and domestic products.

The Tier III assessment would additionally consider the risks and appropriate concentration limits to manage the risks from the use of the chemicals and other isothiazolinones as preservatives in paint formulations.

Regulatory Control

Public Health

Products containing the chemical should be labelled in accordance with state and territory legislation (SUSMP, 2018).

The need for further regulatory control for public health will be determined as part of the Tier III assessment.

Work Health and Safety

The chemical is recommended for classification and labelling aligned with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) as below. This does not consider classification of physical hazards and environmental hazards.

From 1 January 2017, under the model Work Health and Safety Regulations, chemicals are no longer to be classified under the Approved Criteria for Classifying Hazardous Substances system.

Hazard	Approved Criteria (HSIS)[a]	GHS Classification (HCIS)[b]
Acute Toxicity	Not Applicable	Toxic if swallowed - Cat. 3 (H301) Toxic in contact with skin - Cat. 3 (H311)* Fatal if inhaled - Cat. 2 (H330)
Irritation / Corrosivity	Not Applicable	Corrosive to the respiratory tract (AUH071) Causes severe skin burns and eye damage - Cat. 1 (H314)*
Sensitisation	Not Applicable	May cause an allergic skin reaction - Cat. 1A (H317)*

[a] Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(2004)].

[b] Globally Harmonized System of Classification and Labelling of Chemicals (GHS) United Nations, 2009. Third Edition.

* Existing Hazard Classification. No change recommended to this classification

Advice for consumers

Products containing the chemical should be used according to the instructions on the label.

Advice for industry

Control measures

Control measures to minimise the risk from exposure to the chemical should be implemented in accordance with the hierarchy of controls. Approaches to minimise risk include substitution, isolation and engineering controls. Measures required to eliminate, or minimise risk arising from storing, handling and using a hazardous chemical depend on the physical form and the manner in which the chemical is used. Examples of control measures that could minimise the risk include, but are not limited to:

- using closed systems or isolating operations;
- using local exhaust ventilation to prevent the chemical from entering the breathing zone of any worker;
- air monitoring to ensure control measures in place are working effectively and continue to do so;
- minimising manual processes and work tasks through automating processes;
- work procedures that minimise splashes and spills;
- regularly cleaning equipment and work areas; and
- using protective equipment that is designed, constructed, and operated to ensure that the worker does not come into contact with the chemical.

Guidance on managing risks from hazardous chemicals are provided in the *Managing risks of hazardous chemicals in the workplace—Code of practice* available on the Safe Work Australia website.

Personal protective equipment should not solely be relied upon to control risk and should only be used when all other reasonably practicable control measures do not eliminate or sufficiently minimise risk. Guidance in selecting personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

Obligations under workplace health and safety legislation

Information in this report should be taken into account to help meet obligations under workplace health and safety legislation as adopted by the relevant state or territory. This includes, but is not limited to:

- ensuring that hazardous chemicals are correctly classified and labelled;
- ensuring that (material) safety data sheets ((M)SDS) containing accurate information about the hazards (relating to both health hazards and physicochemical (physical) hazards) of the chemical are prepared; and
- managing risks arising from storing, handling and using a hazardous chemical.

Your work health and safety regulator should be contacted for information on the work health and safety laws in your jurisdiction.

Information on how to prepare an (M)SDS and how to label containers of hazardous chemicals are provided in relevant codes of practice such as the *Preparation of safety data sheets for hazardous chemicals—Code of practice* and *Labelling of workplace hazardous chemicals—Code of practice*, respectively. These codes of practice are available from the Safe Work Australia website.

A review of the physical hazards of the chemical has not been undertaken as part of this assessment.

References

Aerts O, Goossens A, Lambert J & JP Lepoittevin, 2017. Contact allergy caused by isothiazolinone derivatives: an overview of non-cosmetic and unusual cosmetic sources. Eur J Dermatol 27(2):115-122.

Amsler E, Aerts O, Raison-Peyron N, Debons M, Milpied B, Giordano-Labadie F, Waton J, Ferrier-Le Bouedec MC, Lartigau I, Pecquet C, Assier H, Avenel-Audran M, Bernier C, Castelain F, Collet E, Crepy MN, Genillier N, Girardin P, Pralong P, Tetart F, Vital-Durand D, Soria A, Barbaud A,& Dermatology Allergy Group (DAG) of the French Society of Dermatology, 2017. Airborne allergic contact dermatitis caused by isothiazolinones in water-based paints: a retrospective study of 44 cases. Contact Dermatitis 77:163-170.

Canadian Centre for Occupational Health and Safety Registry of Toxic Effects of Chemical Substances (CCOHS RTECS). 4-Isothiazolin-3-one, 2-octyl-. Accessed March 2018 at http://ccinfoweb2.ccohs.ca/rtecs/records/NX8156900.html

CosIng Database. Accessed July 2018 at http://ec.europa.eu/growth/tools-databases/cosing/

ECHA (2018). CLH report. Proposal for harmonised classification and labelling. Accessed August 2018 at https://echa.europa.eu/documents/10162/5b573e81-2ffc-377e-233d-11fcb8f6e315

Galleria Chemica. Accessed September 2017 at https://jr.chemwatch.net/galleria/

Globally Harmonised System of Classification and Labelling of Chemicals (GHS) United Nations, 2009. Third edition. Accessed at http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html

Haz-Map Database (Haz-Map), U.S. National Library of Medicine. Accessed July 2018 at https://hazmap.nlm.nih.gov/

Household Products Database, U.S. National Library of Medicine. Accessed July 2018 at https://householdproducts.nlm.nih.gov/index.htm

Lundov MD, Kolarik B, Bossi R, Gunnarsen L& JD Johansen, 2014. Emission of isothiazolinones from water-based paints. Environ Sci Technol 48:6989-6994.

Mose AP, Frost S, Ohlund U, Andersen KE (2013). Allergic contact dermatitis from octylisothiazolinone. Contact Dermatitis 69: 49-52

National Toxicology Program (NTP). Accessed July 2018 at https://ntp.niehs.nih.gov/testing/status/agents/ts-11312-c.html

Personal Care Products Council Ingredients Database. Accessed July 2018 at http://gov.personalcarecouncil.org/jsp/gov/GovHomePage.jsp

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Dossier. 2-octyl-2H-isothiazol-3-one. Accessed July 2018 at https://echa.europa.eu/registration-dossier/-/registered-dossier/24777

Safe Work Australia Hazardous Chemicals Information System (HCIS). Accessed July 2018 at http://hcis.safeworkaustralia.gov.au/

Substances and Preparations in Nordic countries (SPIN) database. Accessed July 2018 at http://www.spin2000.net/spinmyphp/

The Poisons Standard October 2018. The Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) No. 22. Accessed October 2018 at https://www.tga.gov.au/publication/poisons-standard-susmp

US EPA (2007). Reregistration eligibility decision for 2-Octyl-3(2H)-isothiazolone (OIT). Accessed August 2018 at https://archive.epa.gov/pesticides/reregistration/web/pdf/octhilinone-red.pdf

Last update 08 March 2019

Share this page