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May 2014

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

Aluminium molybdenum oxide ($Al_2Mo_3O_{12}$)

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 the Department of Health, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Department of the Environment.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This Public Report is also available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:

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Director
NICNAS

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SUMMARY

The following details will be published in the NICNAS *Chemical Gazette:*

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS CHEMICAL	INTRODUCTION VOLUME	USE
STD/1503	Grace Australia Pty Ltd	Aluminium molybdenum oxide ($Al_2Mo_3O_{12}$)	ND*	≤ 100 tonnes per annum	Component of catalyst for hydro-desulfurisation of heavy oils or fuels

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
Based on the available information, the notified chemical is not recommended for classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia, or the Approved Criteria for Classifying Hazardous Substances (NOHSC, 2004).

Human health risk assessment
Provided that the recommended controls are being adhered to, under the conditions of the occupational setting, the notified chemical is not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, the notified chemical is not considered to pose an unreasonable risk to public health.

Environmental risk assessment
Based on the low hazard and reported use pattern, the notified chemical is not considered to pose an unreasonable risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure during handling of the notified chemical as introduced in the product:
  - Exhaust ventilation during transfer of the catalyst containing the notified chemical
  - Dust filters when required.

- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical as introduced in the product:
  - Avoid direct skin and eye contact
  - Ensure adequate ventilation is present when handling the product containing the notified chemical including disposal of the empty bags.

- A person conducting a business or undertaking at a workplace should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical as introduced in the product:
  - Gloves
  - Face shield, chemical glasses or goggles
  - Respiratory protection if inhalation exposure may occur
  - Protective clothing.

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- A copy of the (M)SDS should be easily accessible to employees.

- If products and mixtures containing the notified chemical are classified as hazardous to health in accordance with the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

Disposal

- The notified chemical should be disposed of to landfill.

Emergency procedures

- Spills or accidental release of the notified chemical should be handled by physical containment, collection and subsequent safe disposal.

Regulatory Obligations

Secondary Notification
This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the chemical under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified chemical is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

(1) Under Section 64(1) of the Act; if
  - The notified chemical is imported in powder form;
  - Information becomes available on the inhalation toxicity of the notified chemical.

or

(2) Under Section 64(2) of the Act; if
  - the function or use of the chemical has changed from being a component of catalyst for hydro-desulfurisation of heavy oils or fuels, or is likely to change significantly;
  - the amount of chemical being introduced has increased, or is likely to increase, significantly;
  - the chemical has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the chemical on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

(Material) Safety Data Sheet
The (M)SDS of the notified chemical provided by the notifier was reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT
Grace Australia Pty Ltd (ABN: 41 080 660 117)
40 Scanlon Drive,
Epping VIC 3076

NOTIFICATION CATEGORY
Standard: Chemical other than polymer (more than 1 tonne per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication: chemical analytical data.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed as follows: Adsorption/desorption, hydrolysis as a function of pH, repeated dose toxicity and bioaccumulation.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
ECHA (2013)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
ICR, HOP, DX, GR and AT grades of catalyst (products containing the notified chemical)

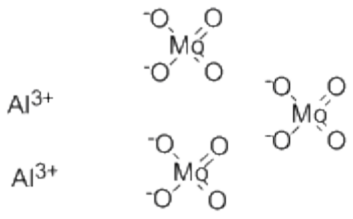
CAS NUMBER
15123-80-5

CHEMICAL NAME
Aluminium molybdenum oxide ($Al_2Mo_3O_{12}$)

OTHER NAME(S)
Aluminum molybdenum oxide ($Al_2Mo_3O_{12}$)
Dodecaaluminium trimolybdenum dodecaoxide
Aluminium molybdate

MOLECULAR FORMULA
$Al_2Mo_3O_{12}$

STRUCTURAL FORMULA



MOLECULAR WEIGHT
533.78 Da

ANALYTICAL DATA
Reference RFA, NMR, IR, UV/Vis and XRD spectra were provided.

3. COMPOSITION

DEGREE OF PURITY
≥ 99%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS
None

NON HAZARDOUS IMPURITIES/RESIDUAL MONOMERS (> 1% BY WEIGHT)
None

ADDITIVES/ADJUVANTS
None

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Odourless white powder

Property	Value	Data Source/Justification
Melting Point	>1100 °C	Measured
Boiling Point	>950 °C	(M)SDS
Density	3716.5 kg/m^3 at 20 °C	Measured
Vapour Pressure	Not determined	Based on the high melting point of the notified chemical, the vapour pressure is expected to be very low.
Water Solubility	0.023 – 0.27 g/L at 20 °C	Measured
pH	4 to 5	MSDS
Hydrolysis as a Function of pH	Not determined	The notified chemical is an inorganic salt of a weak lewis acid and base and salt hydrolysis may proceed. However, no significant hydrolysis is expected under environmental conditions. This hydrolysis reaction corresponds to its solubilisation in water.
Partition Coefficient (n-octanol/water)	Not determined	The notified chemical is inorganic.
Adsorption/Desorption	Not determined	Based on its expected low solubility in water, the notified chemical is expected to settle to sediment and sludge.
Dissociation Constant	Not determined	The notified chemical is an inorganic salt of a weak lewis acid and base and dissociation occurs along with hydrolysis. However, dissociation is expected to be negligible under environmental conditions.
Particle Size	L50=12 µm	Measured (the notified chemical will be introduced into Australia in matrix particles >100 µm).
Flash Point	Not determined	The notified chemical is a solid.
Solid Flammability	Not highly flammable	Measured
Autoignition Temperature	Not auto-flammable	Measured
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties.
Oxidising Properties	Does not meet the classification criteria for oxidising properties	Analogue data

DISCUSSION OF PROPERTIES
For full details of tests on physical and chemical properties, refer to Appendix A.

Reactivity
The notified chemical is expected to be stable under normal conditions of use.

Physical hazard classification
Based on the submitted physico-chemical data depicted in the above table, the notified chemical is not recommended for hazard classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified chemical will not be manufactured or reformulated in Australia. The notified chemical will be imported into Australia as a component of catalyst at up to 10.5% concentration.

MAXIMUM INTRODUCTION VOLUME OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	10-100	10-100	10-100	10-100	10-100

PORT OF ENTRY
Fremantle and Bunbury (WA)
Melbourne and Geelong (VIC)
Adelaide (SA)
Brisbane (QLD)
Sydney (NSW)

IDENTITY OF MANUFACTURER/RECIPIENTS
BP Bulwer, BP Kwinana, Caltex Kurnell, Caltex Lytton, Exxon Mobil Altona, Shell Clyde, Shell Geelong and Queensland Energy Resources- Gladstone.

TRANSPORTATION AND PACKAGING
The product containing the notified chemical (at up to 10.5%) will be transported from the port to customers by road in 100-170 kg UN approved (sealed) drums or 900 kg intermediate bulk containers (IBCs), also referred to as 'big bags'.

USE
The notified chemical will be used as a component of catalyst for the hydro-desulfurisation of heavy oils or fuels.

OPERATION DESCRIPTION
The notified chemical will not be manufactured or reformulated in Australia. The product (catalyst) containing the notified chemical (up to 10.5%) will be unloaded from the big bags or drums into a reactor by trained contractor personnel using refilling equipment. This takes place under exhaust ventilation and using dust filters. No sampling will be conducted. Periodic checks and cleaning of dust filters will be performed. Collected dust will be delivered to certified disposal plant. The whole process will take place in a closed system with no release of catalyst containing the notified chemical expected. The notified chemical will be converted into MoS_2 by coming into contact with the sulfur containing the crude oil. At the end of the life-cycle, the content of the notified chemical in the catalyst is expected to be zero. The used catalyst (solid) will be removed and recycled to recover the metals contained in the catalyst.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

Category of Worker	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Unloading of bags and loading into reactor	4	4
Bale packing of used bags	0.5	4
Reactor maintenance/Cleaning	0.5	4

EXPOSURE DETAILS
It is anticipated that transport drivers and warehouse workers would only be exposed to the material in the event of an accident.

At the end-use sites dermal, ocular and inhalation exposure to the notified chemical at a concentration up to 10.5% would occur during unloading of big bags or drums containing the notified chemical, adding to reactors using refilling equipment, bale packing of used bags and floor cleaning processes. Dermal, ocular and inhalation exposure is expected to be limited by the use of exhaust ventilation, dust filters and appropriate personal protective equipment (PPE), which may vary depending on the tasks being carried out. PPE may include gloves, filter mask and disposable full body suit.

Workers are not expected to be exposed to the notified chemical during the normal operation processes as it will take place in a closed system.

Workers are also potentially exposed to the notified chemical during removal of used material and reactor maintenance; however, the exposure will be limited as the concentration of the notified chemical in the used material will be negligible at this stage. In addition the workers will use PPE.

6.1.2. Public Exposure
The notified chemical is intended for industrial use only, and will not be available to the public. It is not expected to be included in the fuel. Direct exposure of the public would therefore not be expected.

6.2. Human Health Effects Assessment

The results from toxicological investigations conducted on the notified chemical are summarised in the following table. For full details of the studies, refer to Appendix B.

Endpoint	*Result and Assessment Conclusion*
Rat, acute oral toxicity	LD50 >2000 mg/kg bw; low toxicity
Rat, acute dermal toxicity	LD50 >2000 mg/kg bw; low toxicity
Rabbit, skin irritation	slightly-irritating
Eye irritation (HET-CAM)	non-irritating
Rabbit, eye irritation	slightly-irritating
Mouse, skin sensitisation – Local lymph node assay	no evidence of sensitisation
Rat, repeat dose oral toxicity – 90 days (on analogue)	NOAEL 17 mg of (Mo)/kg bw/day
Mutagenicity – bacterial reverse mutation	non mutagenic
Genotoxicity – in vitro micronucleus	non genotoxic

Toxicokinetics, metabolism and distribution.
The notified chemical is an inorganic metallic compound with molybdenum (Mo) in an oxidation state of 6. It is a weak lewis acid and base and has low water solubility. The tendency to hydrolyse is based on its solubility which is pH dependent. Once absorbed, the molybdate anion is widely distributed in the body (28-77%) (Vyskocil and Viau, 1999) with highest concentrations found in the blood, kidneys, liver, adrenal glands and bones. Elimination of the chemical occurs primarily by excretion through the kidney as urine and is enhanced by the intake of high levels of copper and sulfate in the diet. Information on dermal absorption is not available.

Acute toxicity.
The notified chemical is of low acute oral (LD50 > 2000 mg/kg bw) and dermal toxicity (LD50 > 2000 mg/kg bw) in rats. Data available on the acute inhalation toxicity of the notified chemical is not available.

Irritation and sensitisation.
The notified chemical is slightly irritating to the eye and skin of rabbits. In the skin irritation study, slight irritation was observed in one animal that persisted to the 72 hour observation period but was resolved at Day 2 to 7. In the eye irritation study, only slight to moderate conjunctival irritation (redness) and slight chemosis were observed in two treated animals after exposure and persisted to the 72 hour and 48 hour observation period, respectively. These reactions were reversible between 1 to 7 days and 1 to 3 days respectively. The notified chemical was not irritating to the eye in an *in vitro* HET-CAM test. However, this method is not yet validated as a replacement for the *in vivo* method.

A mouse local lymph node assay (LLNA) study showed no evidence of skin sensitisation at 10, 25 and 50% of the notified chemical.

Repeated dose toxicity.
No repeated dose toxicity data were provided on the notified chemical. However, information on repeated dose toxicity on several analogues was supplied.

A 90 day repeated oral dose toxicity study with recovery groups (Hoffman G, M., 2011) was performed on sodium molybdate. The no observed adverse effect level (NOAEL) was determined to be 17 mg (Mo)/kg bw/day (equivalent to 43 mg/kg bw/day of sodium molybdate) based on the effects of reduced body weight gains in both male and female rats and kidney changes in two female rats observed at 60 mg (Mo)/kg bw/day. Levels of Mo in the organs had reduced by 65-84% at the end of the 60 day recovery stage that followed the 90 day exposure period.

In a 13 week repeated dose inhalation toxicity study (NTP, 1997) on molybdenum trioxide in rats and mice exposed at up to 100 mg/m³ of the chemical (6.5 h/d, 5 d/week), the no observed adverse effect concentration (NOAEC) was established to be 100 mg/m³. There were no mortalities, and no treatment related effects on mean body weights, relative or absolute organ weights, haematology or microscopic lesions. In a two year repeated dose inhalation toxicity study (NTP, 1997) on the same analogue and dosage in rats and mice, development of respiratory system lesions was observed. Survival rates of exposed rats and mice were similar to the controls. The incidence and severity of chronic alveolar inflammation in the lungs increased with increasing exposure concentration in rats but not in mice. Incidences of alveolar/bronchiolar adenoma or carcinoma (combined) were increased in male rats and considered secondary to irritation and inflammation caused by the local acidity of the chemical particles. Incidences of hyaline degeneration that were observed in the nasal respiratory epithelium were attributed to nonspecific defensive or adaptive responses to chronic inhalation exposure to the chemical in both rats and mice.

In a 28 day combined repeated oral dose toxicity study with reproduction toxicity screening test on aluminium chloride (OECD TG 422) (Beekhuijzen, 2007), groups of Wistar rats were administered 0, 40, 200 or 1000 mg/kg bw/day. No mortality or clinical signs of toxicity were observed. The NOAEL for local toxic effects on stomach was established at 200 mg/kg bw/day based on irritation effects on glandular stomach mucosa and several statistically significant changes in clinical pathology parameters seen at 1000 mg/kg bw/day. No reproductive or developmental toxicity was observed.

Aluminium citrate was administered to a group of SD rats at 80 mmole/L in drinking water for 8 months (Friedrich, D., 2013). There were no significant group differences in blood urea concentration (suggesting that kidney function was not altered by the aluminium (Al) administration). Changes in the blood parameters compared to controls were seen. Al concentrations in the bone, spleen, liver, kidney and plasma were significantly higher in the Al treated groups than in the controls. No correlation between plasma Al concentrations and Al levels in the organs or any other biochemical findings was observed. No significant group differences in brain Al concentrations were noted.

In a one year developmental and neurobehavioural toxicity study in rats (Alberta Research Council Inc, 2010), pregnant dams (n=20/group) were administered with aluminium citrate at up to 3225 mg (Al citrate)/kg bw/day (corresponding to 300 mg (Al)/kg bw/day). Two control groups received either sodium citrate solution (27g/L) to the high dose Al citrate or plain water. The Al citrate and sodium (Na) citrate were dosed to dams ad libitum in the drinking water form gestation day 6 until weaning of offspring. Weaned offspring were dosed at the same

levels as their dams through to one year of life. No significant differences in body weights throughout the study were observed in the low and mid dose. Neuromuscular adverse effects (reduction fore and hind limb grip strength and foot splay) were detected at both high and mid doses levels (300 and 100 mg/Al/kg bw/day). High dose group showed physiological adverse effects (urinary tract, growth rate, maturation rate haematological and clinical chemistry) and concentrations of Al in blood, femur, liver and some CNS tissues were significantly higher than controls. There was no evidence of an effect of learning or memory in this study and the reported NOAEL was 30 mg (Al)/kg bw/day.

Based on the available analogue data the notified chemical is expected to have some toxicity after repeated oral exposure. Based on solubility considerations, this is likely to be less than the chronic toxicity of sodium molybdate. Toxicity associated with repeated inhalation exposure is probable; however, its severity is uncertain, due to lack of data on the notified chemical.

Mutagenicity/Genotoxicity.
The notified chemical was not mutagenic in a bacterial reverse mutation study, and was not genotoxic in an *in vitro* micronucleus study in human lymphocytes.

Reproductive / Developmental
Data is not available on the notified chemical. In a 90 day oral study on sodium molybdate in rats, testicular or gonadal and sperm and oestrous cycle effects were not seen up to the highest dose tested, 60 mg (Mo)/kg bw/day.

Carcinogenicity
No carcinogenicity data were provided on the notified chemical. However, an analogue (molybdenum trioxide) is classified as Carcinogenic – Category 3. The inhalation carcinogenicity of molybdenum trioxide is due to acidic insoluble particles in the lungs causing fibrosis (NTP, 1997). The notified chemical is not expected to have as high acidity as the analogue. However, similar adverse effects of the notified chemical cannot be ruled out.

Health hazard classification
Based on the available information, the notified chemical is not recommended for classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety
Based on the available information, the notified chemical is of low acute oral and dermal toxicity, a slight skin and eye irritant, non skin sensitising and not expected to be genotoxic. Information on analogues suggests that it is likely to have some repeated dose toxicity orally. Adverse effects from inhalation cannot be ruled out, due to lack of data on the notified chemical.

Particles of the notified chemical are in the respirable (L50=12 μm) size scale. However, when introduced into Australia, the notified chemical will be a component of a catalyst matrix with particles >100 μm (pellet form). Therefore inhaled particles would not reach the lungs, and would instead be ingested. Dermal, ocular and inhalation exposure is expected to be limited by the use of adequate exhaust ventilation systems, and appropriate personal protective equipment (PPE).

Provided that control measures are in place to minimise worker exposure to the notified chemical, the risk to the health of workers from use of the notified chemical is not considered to be unreasonable.

6.3.2. Public Health
The notified chemical is only intended for use in industrial settings. The public may only be exposed to the notified chemical in the unlikely event of an accident during transport. Therefore, when used in the proposed manner, the risk to public health from the notified chemical is not considered to be unreasonable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified chemical will not be manufactured or reformulated in Australia. Therefore, no releases from these activities are expected.

The notified chemical will be refilled from big bags into flow bins, from flow bins into the reactor, or from drums directly into reactor at dedicated chemical warehouses. Spills or accidental release of the notified chemical are expected to be collected and disposed of in accordance with local authorities.

RELEASE OF CHEMICAL FROM USE

The notified chemical is part of a catalyst system and is converted into MoS_2 by coming into contact with sulphur containing crude oil. A complete conversion of the notified chemical into MoS_2 is expected.

RELEASE OF CHEMICAL FROM DISPOSAL

At the end of its life time the notified chemical is converted into MoS_2 thereby deeming it to be a poisoned catalyst which is regarded as waste and will be recycled to recover the high value metals contained in it.

7.1.2. Environmental Fate

The notified chemical is part of a catalyst system and is converted into MoS_2 by coming into contact with sulphur containing crude oil. A complete conversion into MoS_2 is expected and the whole amount of used catalyst is regarded as waste and will be recycled to recover the high value metals contained in the catalyst.

There are no environmental fate data for the notified chemical. The notified chemical converted into MoS_2 is not expected to be released to the environment because it is used within closed reactors. In the unlikely case that the notified chemical is released in the environment, it is assumed that under environmental conditions in aqueous media, only minor amounts of it will be present in bioavailable form due to low water solubility. Under environmental conditions the concentration of soluble Al^{3+} and MnO_4^{2-} ions released from the notified chemical is expected to be very low. Therefore, the notified chemical is not expected to be significantly bioaccumulative in the environment.

7.1.3. Predicted Environmental Concentration (PEC)

The notified chemical is not expected to be present at significant concentrations in the aquatic environment because of the very low potential for direct release to surface waters when used in closed reactors. A Predicted Environmental Concentration (PEC) has therefore not been calculated.

7.2. Environmental Effects Assessment

The results from ecotoxicological investigations conducted on the notified chemical are summarised in the table below. Details of these studies can be found in Appendix C.

Endpoint	*Result*	*Assessment Conclusion*
Fish Toxicity	EC50 (96 h) > 100 mg/L	Not harmful to fish
Daphnia Toxicity	EC50 (48 h) > 100 mg/L	Not harmful to aquatic invertebrates
Algal Toxicity	ErC50 (72 h) > 100 mg/L	Not harmful to algae
Inhibition of Bacterial Respiration	NOEC (3 h) > 1000 mg/L	Not expected to inhibit bacterial respiration

The notified chemical is not expected to be harmful to aquatic organisms at its solubility limit in the aquatic environment. Therefore, under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) (United Nations, 2009), the notified chemical is not expected to be harmful to fish, invertebrates and algae and is not formally classified under the GHS.

7.2.1. Predicted No-Effect Concentration

A Predicted No-Effect Concentration (PNEC) for the aquatic compartment has not been calculated since the notified chemical is not considered to be harmful up to the limit of its solubility in water.

7.3. Environmental Risk Assessment

A Risk Quotient is unable to be quantified as a PEC and PNEC were not calculated. There is no significant aquatic release of the notified chemical anticipated based on its reported use pattern. At the end of its life time the notified chemical is converted into MoS_2 thereby deeming it to be a poisoned catalyst which is regarded as waste and will be recycled to recover the high value metals contained in it. Due to its low water solubility and complex inorganic structure it is not expected to be mobile or bioavailable. The notified chemical is not expected to be bioaccumulative due to limited bioavailability. Therefore, based on the assessed use pattern, the notified chemical is not expected to pose an unreasonable risk to the environment.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Melting Point/Freezing Point >1100 °C

Method OECD TG 102 Melting Point.
Remarks The capillary / metal block method was used up to 400ºC, followed by heating in a muffle oven up to 1100°C. No melting was observed.
Test Facility LAUS GmbH (2012e)

Density 3716.5 kg/m^3 at 20 °C

Method OECD TG 109 Density of Liquids and Solids.
Remarks The study was carried using the pycnometer method, with a fitted thermometer. At all weighings, the corresponding temperature was recorded.
Test Facility LAUS GmbH (2012c)

Water Solubility 0.023 – 0.27 g/L at 20 °C

Method OECD TG 105 Water Solubility.
EC Council Regulation No 440/2008 A.6 Water Solubility.
Remarks Flask Method. The solubility of test substance in water was determined from the measured concentrations of aluminium (Al) and molybdenum (Mo) in the filtered test solutions. The concentration of the test substance in water based on Al and Mo were 23–269 mg/L and 24–263 mg/L respectively. The nominal concentration of the test substance in water was 50–700 mg/L. The solubility of the notified chemical was dependent on nominal loading.
Test Facility LAUS GmbH (2012f)

Particle Size Median 12 µm

Method OECD TG 110 Particle Size Distribution/Fibre Length and Diameter Distributions.

Particle size(µm)	*Volume (%)*
< 3.25	10
< 11.92	50
< 44.91	90

Remarks The notified chemical particle size was determined by dispersion and laser diffraction measurement using the Malvern Mastersizer 2000. The median particle size L50 = 12 µm (11.92 µm). However, The notified chemical will be imported into Australia in matrix particles >100 µm.
Test Facility Möller, M. (2012)

Solid Flammability Not highly flammable

Method EC Council Regulation No 440/2008 A.10 Flammability (Solids).
(EU-Method A. 10 and UN N.1, 2009).
Remarks No ignition occurred within two minutes after heating the notified chemical with the Teclu burner flame. Only glowing and a small carbonisation were observed during heating.
Test Facility LAUS GmbH (2012d)

Autoignition Temperature Not auto-flammable

Method EC Council Regulation No 440/2008 A.16 Relative Self-Ignition Temperature for Solids.
(EU-Method A.16).
Remarks A ZPA-3 Laboratory oven with temperature programming, natural air circulation and explosion pressure relief was used. Wire mesh cube was filled with the notified chemical and heated at a rate of 0.5 °C /min, from room temperature (23.5 °C) to 400ºC. No increase in the temperature of the test sample in comparison to that of the oven could be detected, and no signs of ignition were observed.
Test Facility LAUS GmbH (2013c)

Oxidizing Properties Does not meet the classification criteria for oxidising properties

Method	Performed according to the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part 34.4.1 (Test O.1)
Remarks	The oxidising properties test was carried out on the analogue chemical molybdenum trioxide (CAS No. 1313-27-5). Five tests were conducted on the test item mixed with cellulose at ratios of 1:1 and 4:1 (by mass of sample to cellulose). An inert metal wire connected to electrical power was used as an ignition source. Power is applied to the ignition wire and maintained for up to three minutes.
Test Facility	Möller, M. (2009)

APPENDIX B: TOXICOLOGICAL INVESTIGATIONS

B.1. Acute toxicity – oral

TEST SUBSTANCE Notified Chemical

METHOD OECD TG 423 Acute Oral Toxicity – Acute Toxic Class Method.
Species/Strain Rat/Sprague Dawley
Vehicle Olive oil
Remarks - Method No protocol deviation occurred during the study.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw*	*Mortality*
1	3 F	2000	0
2	3 F	2000	0

LD50 >2000 mg/kg bw
Signs of Toxicity No clinical signs were observed
Effects in Organs None
Remarks - Results No treatment related changes were observed

CONCLUSION The notified chemical is of low toxicity via the oral route.

TEST FACILITY Colas, S. (2011b)

B.2. Acute toxicity – dermal

TEST SUBSTANCE Notified Chemical

METHOD OECD TG 402 Acute Dermal Toxicity.

Species/Strain Rat/ Sprague Dawley
Vehicle
Type of dressing Occlusive/Semi-occlusive.
Remarks - Method No protocol deviation occurred during the study.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw*	*Mortality*
1	5 M, 5 F	2000	0

LD50 >2000 mg/kg bw
Signs of Toxicity - Local No cutaneous reactions were observed
Signs of Toxicity - Systemic No systemic clinical signs were observed
Effects in Organs None
Remarks - Results No treatment related changes were observed

CONCLUSION The notified chemical is of low toxicity via the dermal route.

TEST FACILITY Colas, S. (2011a)

B.3. Irritation – skin

TEST SUBSTANCE Notified Chemical

METHOD OECD TG 404 Acute Dermal Irritation/Corrosion.

Species/Strain	Albino Rabbit/New Zealand White
Number of Animals	3 M
Vehicle	Distilled water
Observation Period	7 days
Type of Dressing	Semi-occlusive.
Remarks - Method	No deviation from protocol was recorded. The notified chemical was applied at 0.5 g (moistened with distilled water to ensure a good contact with the skin) for 4 hours on one flank of the rabbit. The other untreated flank of each rabbit served as control.

RESULTS

Lesion	*Mean Score* Animal No.*			*Maximum Value*	*Maximum Duration of Any Effect*	*Maximum Value at End of Observation Period*
	1	2	3			
Erythema/Eschar	0.3	0.3	1	1	< 7 days	0
Oedema	0	0	0	0	-	0

* Calculated on the basis of the scores at 24, 48, and 72 hours for EACH animal.

Remarks - Results	A slight erythema and a slight oedema were observed in all treated rabbits after one hour of the patch removal. Oedema reactions were reversible on day one while erythema reactions were reversible after 2 to 7 days.

CONCLUSION The notified chemical is slightly-irritating to the skin.

TEST FACILITY Colas, S (2013b)

B.4. Irritation – eye

TEST SUBSTANCE Notified Chemical

METHOD OECD TG 405 Acute Eye Irritation/Corrosion.

Species/Strain	Rabbit/New Zealand White
Number of Animals	3 M
Observation Period	7 days
Remarks - Method	The notified chemical (0.1 g) was instilled in the conjunctival sac of one eye. The other untreated eye served as the control. Remaining test material was rinsed from the eye one hour after instillation.

RESULTS

Lesion	*Mean Score* Animal No.*			*Maximum Value*	*Maximum Duration of Any Effect*	*Maximum Value at End of Observation Period*
	1	2	3			
Conjunctiva: redness	1	0	0.7	1	< 7 days	0
Conjunctiva: chemosis	0.7	0	0.3	1	< 72 h	0
Conjunctiva: discharge	0	0	0	0	-	-
Corneal opacity	0	0	0	0	-	-
Iridial inflammation	0	0	0	0	-	-

* Calculated on the basis of the scores at 24, 48, and 72 hours for EACH animal.

Remarks - Results	Reversible slight to moderate conjunctivae reactions but were observed: A slight to moderate redness and a slight chemosis were observed after one hour of the notified chemical instillation in the eye of the rabbit. These reactions were reversible between 1 to 7 days and 1 to 3 days respectively.

CONCLUSION The notified chemical is slightly-irritating to the eye.

TEST FACILITY Colas, S (2013a)

B.5. Irritation – eye (in vitro)

TEST SUBSTANCE Notified Chemical

METHOD HET-CAM Test following ICCVAM recommended test protocol dated November 2006

Vehicle

Remarks - Method No protocol deviation occurred during the study. The HET-CAM test measures the test substance ability to induce toxicity in the chorioallantoic membrane (CAM) of a chicken. Lohmann Leghorn chicken's eggs were incubated at 38.5 °C and 58-59.7% humidity for 8 days. The eggs between 50 and 60 g were only used for the test. Sodium chloride solution at 0.9% was used as negative control. Sodium dodecyl sulfate (SDS) and sodium hydroxide (NaOH) solutions were used as positive controls at 1% and 0.1 N concentrations respectively. Haemorrhage, coagulation and vessel lysis effects were measured. Scores were derived from the individual and combined measurements/assessments and used to classify the irritancy level of the test substance.

RESULTS

Test material	*Irritation Scores*	*Mean irritation scores*
Negative control	0, 0, 0	0
Test substance	0, 0, 0, 0, 0, 0	0
Positive control (0.1N NaOH)	19.87, 19.94, 20.03	19.95
Positive control (1% SDS)	11.02, 11.02, 11.10	11.05

Remarks - Results The notified chemical showed no effects on the blood vessels of the CAM. The notified chemical calculated mean irritation score was 0.

CONCLUSION The notified chemical was considered to be non-irritating to the eye under the conditions of the test.

TEST FACILITY LAUS GmbH (2012i)

B.6. Skin sensitisation – mouse local lymph node assay (LLNA)

TEST SUBSTANCE Notified Chemical

METHOD OECD TG 429 Skin Sensitisation: Local Lymph Node Assay
EC Directive 2004/73/EC B.42 Skin Sensitisation (Local Lymph Node Assay)

Species/Strain Mouse/CBA/Ca

Vehicle N,N-Dimethylformamide (DMF)

Remarks - Method Preliminary test was performed at 50% and 25% concentrations of the test substance as suspension in DMF. (The test substance was insoluble in vehicles recommended in TG429). The suspensions were applied to the ears of mice. No clinical signs or irritation were seen. The main test was performed at three different concentrations (10, 25 and 50%) according to the results of the preliminary test.

The negative control groups were treated with DMF and acetone:olive oil (4:1) for the test substance group and the positive control group

respectively. The positive control group was treated with 25% α-hexylcinnamaldehyde (HCA) in acetone:olive oil.

RESULTS

Concentration (% w/w)	*Proliferative response (DPM/lymph node)*	*Stimulation Index (Test/Control Ratio)*
Test Substance		
0 (vehicle control for the test substance: DMF)	908.9	1.0
10	368.6	0.4
25	408.7	0.4
50	797.2	0.9
Positive Control HCA		
0 (vehicle control) for the positive control (acetone:olive oil, 4:1)	923.8	1.0
25%	5083.2	5.5

Remarks - Results: None of the concentrations of the notified chemical produced an increase in the proliferative response, compared to the controls, and the stimulation indices were all <1. The positive control showed a stimulation index of 5.5, confirming the validity of the test system.

CONCLUSION: There was no evidence of induction of a lymphocyte proliferative response indicative of skin sensitisation to the notified chemical.

TEST FACILITY: Pénzes, M. (2011)

B.7. Repeat dose toxicity

TEST SUBSTANCE: Sodium molybdate dihydrate (analogue)

METHOD

OECD TG 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents.

Species/Strain: Albino Rats/Sprague Dawley CD
Route of Administration: Oral/diet
Exposure Information: Total exposure days: 90 days, with 60 day recovery group.
Dose regimen: 7 days per week
Vehicle: Certified Rodent Diet, No. 2016C (meal)
Remarks - Method: The method was modified using OECD TG 416 to include additional parameters: oestrous cycles and sperm analysis. Molybdenum (Mo) in blood was determined in weeks 4 and 12, and during the first week of the recovery stage, and the content of Mo in organs was determined after sacrifice.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw/day(as Molybdenum)*	*Mortality*
control	10M, 10F	0	0
low dose	10M, 10F	5	0
mid dose	10M, 10F	17	0
high dose	10M, 10F	60	1(incidental on day 47)
control recovery	10M, 10F	0	0
high dose recovery	10M, 10F	60	0

Mortality and Time to Death

There was no test substance related mortality. However, one male rat (at 60 mg/kg bw/day dose) was found dead on day 47. There were no clinical signs or body weight effects prior to death. No macroscopic or microscopic findings explained the cause of death and this single death was considered non test substance related.

Clinical Observations

No clinical observable signs of toxicity were detected.

Statistically significant decreases in body weight gains in the 60 mg/kg bw/day males and females were observed and the absolute body weights were 15.1% and 5.6% less than the controls respectively.

Laboratory Findings – Clinical Chemistry, Haematology, Urinalysis,

There were no test substance-related clinical chemistry or hematologic findings. Statistically significant decreases in uric acid and creatinine in female rats and total protein and calcium in male rats were observed but were considered not dose related due to outliers in control animals and were within normal biological variability.

Mo was detected in serum and blood in a dose dependent manner, and had reduced by Day 7 of the recovery period. The concentration of Mo in liver and kidneys increased with dose, but not in a fully dose dependent manner. The levels in the high dose recovery animals were substantially reduced compared to the high dose test group, 16-19% of original values in males, and 30-35% of original values in females.

The copper (Cu) content of liver and kidney was noted to be increased in the high dose group, compared to controls.

Effects in Organs

No vaginal cytology or oestrous cycle effects were observed during weeks 7-9 of the dosing phase. However, microscopic findings were observed in the kidneys of female rats dosed at 60 mg/kg bw/day. Slight diffuse hyperplasia of the proximal tubules in the kidney of two female rats was seen. There were no changes in the reproductive tissues (testes, epididymides, prostates, seminal vesicles, ovaries, uterus or vagina). Male rats dosed at 5 and 60 mg/kg bw/day showed minimal/slight vacuolation in the cells of the zona fasiculata of the adrenal cortex compared to the controls. This increased incidence of the finding was considered incidental and unrelated to the test substance as the intermediate dose did not show similar finding. Such increased cortical vacuolation of the adrenal is common in rats reflecting normal and variable physiological activity.

CONCLUSION

The No Observed Adverse Effect Level (NOAEL) was established as 17 mg/kg bw/day (as Mo) in this study, based on the effects on body weights and kidneys observed at 60 mg/kg bw/day dose. The equivalent NOAEL for sodium molybdate dihydrate is 43 mg/kg bw/day.

The NOAEL for testicular (or gonadal) and sperm and oestrous cycle effects is >60 mg/kg bw/day (as Mo) or > 152 mg/kg bw/day for sodium molybdate dihydrate.

TEST FACILITY	Hoffman G, M. (2011)

B.8. Genotoxicity – bacteria

TEST SUBSTANCE	Notified Chemical
METHOD	OECD TG 471 Bacterial Reverse Mutation Test. EC Directive 2000/32/EC B.13/14 Mutagenicity – Reverse Mutation Test using Bacteria. Plate incorporation procedure (1st test) and pre-incubation procedure (2nd test)
Species/Strain	*S. typhimurium*: TA1535, TA98, TA100, TA102, TA97a
Metabolic Activation System	S9-mix from Aroclor- induced rat (SD) liver

Concentration Range in Main Test	a) With metabolic activation: 317-5049 µg/plate b) Without metabolic activation: 317-5049 µg/plate
Vehicle	Deionised water
Remarks - Method	There were no deviations from the study protocol. The concentrations used were nominal ones, as suspensions had to be used because of the poor solubility of the test substance. No preliminary test was performed.

RESULTS

Metabolic Activation	*Test Substance Concentration (µg/plate) Resulting in:*			
	Cytotoxicity in Preliminary Test	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Test 1		>4993	None	Negative
Test 2		>5049	None	Negative
Present				
Test 1		>4993	None	Negative
Test 2		>5049	None	Negative

Remarks - Results	Undissolved particles were visible on the plates. The positive controls performed as expected, confirming the validity of the test system.

CONCLUSION The notified chemical was not mutagenic to bacteria under the conditions of the test.

TEST FACILITY LAUS GmbH (2012h)

B.9. Genotoxicity – in vitro

TEST SUBSTANCE Notified Chemical

METHOD OECD TG 487 In Vitro Mammalian Cell Micronucleus Test.

Species/Strain	Human lymphocytes/Blood culture
Cell Type/Cell Line	Blood cells
Metabolic Activation System	S9-mix from Aroclor- induced rat liver
Vehicle	Deionised water, fetal calf serum, ethanol or DMSO
Remarks - Method	Three independent experiments were performed. Cytokinesis block proliferation Index (CBPI) was calculated for the toxicity assessment of the test substance to cultured human lymphocytes. At least 500 cells were used per culture. The test item was prepared by suspension in cell culture medium and shaken for 24 h (Experiments 1 and 2) or 96 h (Experiment 3). The suspension was then centrifuged and the supernatant was used. No test concentrations were given, as the concentration of the supernatant is unknown. The positive controls used were: Mitomycin C (MMC) without S9 mix and cyclophosphamide monohydrate, (CPA) with S9 mix. Solvent controls were culture medium without foetal calf serum for the test substance and 0.9% NaCl for the positive control CPA.

Metabolic Activation	*Test Substance Dilutions selected for scoring of micronuclei**	*Exposure Period*	*Harvest Time*
Absent			
Test 1	1:10, 1:20 and 1:40	4±1h	18±2h

Test 2	1:10, 1:20 and 1:40	20±2h	20±2h
Test 3	1:10	20±2h	20±2h
Present			
Test 1	1:10, 1:20 and 1:40	4±1h	18±2h
Test 2	1:10, 1:20 and 1:40	4±1h	18±2h
Test 3	1:10	4±1h	

*1:10 dilution corresponds to 50 mg/mL nominal loading.

RESULTS

Metabolic Activation	*Cytotoxicity in Preliminary Test*	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Test 1	3.9%, 3.7% and -0.1% (PC: 9.6%)		Nil	Negative
Test 2		2.3, 2.7 and 0.3% (PC: 14.8%)	Nil	Negative
Test 3		3.8% (PC: 14.4%)	Nil	Negative
Present				
Test 1	Nil		Nil	Negative
Test 2		-1.0%, 1.4% and -2.8% (PC:12.9%)	Nil	Negative
Test 3		5.6% (PC: 11.2%)	Nil	Negative

PC= Positive control
Negative control in all tests =Nil

Remarks - Results	In all independent experiments on the test substance, in the presence and absence of S9 mix, no biologically relevant increase in binucleated cells with micronuclei was observed. Extension of the extraction time (in Experiment 3) did not increase the number of micronuclei. The positive controls showed distinct increases in binucleated cells with micronuclei.
CONCLUSION	The notified chemical was not clastogenic to human lymphocytes treated in vitro under the conditions of the test.
Test Facility	LAUS GmbH (2013b)

APPENDIX C: ENVIRONMENTAL FATE AND ECOTOXICOLOGICAL INVESTIGATIONS

C.1. Ecotoxicological Investigations

C.2.1. Acute toxicity to fish

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 203 Fish, Acute Toxicity Test - Static
Species	Zebra fish (*Danio rerio*)
Exposure Period	96 hours
Auxiliary Solvent	Not reported
Water Hardness	1.08 mmol/L
Analytical Monitoring	Atomic Absorption Spectroscopy (AAS)
Remarks – Method	The test was conducted according to the guidelines above and good laboratory practice (GLP) principles. No significant deviations from the test guidelines were reported. As the solubility of the test substance was found to be below 100 mg/L, a saturated solution of the test substance was prepared. Test substance (100 mg) was added to 1L of dilution water. The mixture was stirred vigorously for 24 hours. The resulting solution was filtered through 0.45µm filters.

RESULTS

Concentration mg/L	*Number of Fish*	*Mortality*			
Nominal		*24 h*	*48 h*	*72 h*	*96 h*
Control	7	0	0	0	0
100	7	0	0	0	0

EL50	> 100 mg/L at 96 hours.
NOEL	≥ 100 mg/L
Remarks – Results	All validity criteria for the test were satisfied. The result is based on the nominal concentration.
CONCLUSION	The notified chemical is not harmful to fish up to the limit of its solubility.
TEST FACILITY	LAUS GmbH (2013a)

C.2.2. Acute toxicity to fish

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 203 Fish, Acute Toxicity Test - Static
Species	Chinese Rare Minnow (*Gobiocypris rarus*)
Exposure Period	96 hours
Auxiliary Solvent	Not reported
Water Hardness	165 $CaCO_3$ mg/L
Analytical Monitoring	Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
Remarks – Method	The test was conducted according to the guidelines above and good laboratory practice (GLP) principles. No significant deviations from the test guidelines were reported. Test substance (100 mg) was added to 1L of dilution water. The mixture was stirred vigorously in dark for 72 hours. The resulting solution was filtered through a 0.45µm filter.

RESULTS

Concentration mg/L *Nominal*	*Number of Fish*	*Mortality* *24 h*	*48 h*	*72 h*	*96 h*
Control	7	0	0	0	0
100	7	0	0	0	0

EL50	>100 mg/L at 96 hours.
NOEL	Not reported
Remarks – Results	All validity criteria for the test were satisfied. The result is based on the nominal concentration.
CONCLUSION	The notified chemical is not harmful to fish up to the limit of its solubility.
TEST FACILITY	Bioassay and Safety (2013)

C.2.3. Acute toxicity to aquatic invertebrates

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 202 *Daphnia* sp. Acute Immobilisation Test - Static
Species	*Daphnia magna*
Exposure Period	48 hours
Auxiliary Solvent	None
Water Hardness	250 mg $CaCO_3$/L
Analytical Monitoring	AAS
Remarks - Method	The test was conducted according to the guidelines above and good laboratory practice (GLP) principles. No significant deviations from the test guidelines were reported. As the solubility of the test substance was found to be below 100 mg/L, a saturated solution of the test substance was prepared. Test substance (100 mg) was added to 1L of dilution water. The mixture was stirred vigorously for 24 hours. The resulting solution was filtered through 0.45µm filters.

RESULTS

Concentration mg/L *Nominal*	*Number of D. magna*	*Number Immobilised* *24 h*	*48 h*
Control	20	0	0
100	20	0	0

LL50	> 100 mg/L at 48 hours
NOEL	Not reported
Remarks - Results	All validity criteria for the test were satisfied. The result is based on the nominal concentration.
CONCLUSION	The notified chemical is not harmful to aquatic invertebrates up to the limit of its solubility.
TEST FACILITY	LAUS GmbH (2012a)

C.2.4. Algal growth inhibition test

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 201 Alga Growth Inhibition Test
Species	Fresh water alga *(Desmodesmus subspicatus)*
Exposure Period	72 hours
Concentration Range	Nominal: 4.6, 10, 22, 46 and 100 mg/L
Auxiliary Solvent	None
Water Hardness	45 mg/L
Analytical Monitoring	AAS

Remarks - Method	The test was conducted according to the guidelines above and good laboratory practice (GLP) principles. No significant deviations from the test guidelines were reported. Test substance (125 mg) was added to 1L of dilution water. The mixture was stirred vigorously for 24 hours. The resulting solution was filtered through 0.45µm filters to give a stock solution. The test concentrations were prepared by diluting the stock solution with deionised water.

RESULTS

Biomass		*Growth*	
E_bL50 *mg/L at 72h*	*NOE_bL* *mg/L at 72 h*	*E_rL50* *mg/L at 72h*	*NOE_rL* *mg/L at 72 h*
>100	≥ 100	> 100	≥ 100

Remarks - Results	The test was considered reliable as all validity criteria of the OECD test guideline were satisfied. The results above were based on nominal concentrations.
CONCLUSION	The notified chemical is not harmful to algae up to the limit of its solubility.
TEST FACILITY	LAUS GmbH (2012b)

C.2.5. Inhibition of microbial activity

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 209 Activated Sludge, Respiration Inhibition Test.
Inoculum	Activated sludge
Exposure Period	3 hours
Concentration Range	Nominal: 1.0 −1000 mg/L
Remarks – Method	The test was conducted according to the guidelines above. No significant deviations from the test guidelines were reported.
RESULTS	
IC50	> 1000 mg/L
NOEC	1000 mg/L
Remarks – Results	All validity criteria for the test were satisfied.
CONCLUSION	The notified chemical is not expected to inhibit microbial respiration.
TEST FACILITY	LAUS GmbH (2012g)

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