Lead chromates: Human health tier II assessment

24 April 2015

Chemicals in this assessment

Chemical Name in the Inventory	CAS Number
C.I. Pigment Yellow 34	1344-37-2
Chromic acid (H2CrO4), lead(2+) salt (1:1)	7758-97-6
Silicic acid, chromium lead salt	11113-70-5
C.I. Pigment Red 104	12656-85-8
Lead chromate oxide (Pb2(CrO4)O)	18454-12-1
Chromium lead oxide sulfate	53529-09-2

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

Grouping Rationale

The chemicals in this group are part of the 'lead chromate pigments' family and are composed of: (1) the pure lead chromates; (2) the mixed phase pigment of lead chromate and lead sulphate (lead sulfochromate pigment); and (3) the mixed phase pigment of lead chromate, lead sulphate and lead molybdate (ECHA, SVHC Support Document, 2009). These compounds consist of insoluble chromium in the hexavalent (VI) oxidation state and insoluble lead. Considering the hazardous nature of lead and chromate, it is expected that these two components will drive the toxicological profile of this group. All the chemicals in this group have similar end uses, typically in the paint and pigment industries.

The toxic properties of insoluble lead (selected lead-based pigments) and insoluble chromates (chromates and dichromates (insoluble)) have both been assessed as Tier II Inventory Multi-tiered Assessment and Prioritisation (IMAP) assessments (NICNASa; NICNASb). In the absence of data on chemicals in this group, data from insoluble lead and insoluble chromates are used as 'read-across'.

Import, Manufacture and Use

Australian

The following Australian industrial uses were reported under previous mandatory and/or voluntary calls for information.

The chemicals, C.I. Pigment Yellow 34 (CAS No. 1344-37-2), C.I. Pigment Red 104 (CAS No. 12656-85-8) and lead chromate (CAS No. 7758-97-6) have the following reported commercial uses including:

- in industrial surface coatings for metals, automotive, aerospace, and road markings;
- in inks; and
- as pigments for plastics.

In addition, the chemicals C.I. Pigment Yellow 34 (CAS No. 1344-37-2) and C.I. Pigment Red 104 (CAS No. 12656-85-8) have the following reported commercial uses including in:

- ceramics; and
- powder coatings.

No specific Australian use, import, or manufacturing information has been identified for the chemicals, lead chromate oxide (CAS No. 18454-12-1), chromium lead oxide sulfate (CAS No. 53529-09-2), silicic acid and chromium lead salt (CAS No. 11113-70-5).

The total volume of C.I. Pigment Yellow 34 (CAS No. 1344-37-2), C.I. Pigment Red 104 (CAS No. 12656-85-8), lead chromate (CAS No. 7758-97-6) introduced into Australia, reported under previous mandatory and/or voluntary calls for information, was less than 1000 tonnes.

International

The following international uses have been identified through European Union Registration, Evaluation and Authorisation of Chemicals (REACH) dossiers; REACH Substances of Very High Concern (SVHC); Galleria Chemica; and eChemPortal: the US Environmental Protection Agency's Aggregated Computer Toxicology Resource—ACToR, and the US National Library of Medicine's Hazardous Substances Data Bank—HSDB.

The chemical, C.I Pigment Yellow 34 (CAS No. 1344-37-2) has reported domestic use including in materials used in arts, crafts or hobbies, other than material for use by children.

The chemicals, C.I Pigment Yellow 34 (CAS No. 1344-37-2), C.I. Pigment Red 104 (CAS No. 12656-85-8), lead chromate (CAS No. 7758-97-6), lead chromate oxide (CAS No. 18454-12-1), chromium lead oxide sulfate (CAS No. 53529-09-2) and silicic acid, chromium lead salt (CAS No. 11113-70-5) have reported commercial use including:

- in industrial surface coatings for metals, automotive, aerospace, and road markings;
- as a colour pigment in paint, ink, ceramics, plastics and as an anticorrosive pigment in primers; and
- in reprographic agents.

The chemical, lead chromate (CAS No. 7758-97-6) has additional commercial use including as:

- formulation components of detergents and bleaches; and
- the polymer component of an article.

Restrictions

Australian

The following restrictions apply to chemicals in this group based on restrictions for lead compounds and chromate compounds.

Lead and chromium compounds are listed in the Poisons Standard (the Standard for the Uniform Scheduling of Medicines and Poisons—SUSMP) (SUSMP, 2013) under the following Schedules:

'***Schedule 6***

LEAD COMPOUNDS unless specified in Appendix C or:

(a) when included in Schedules 4 or 5;

(b) in paints, tinters, inks or ink additives;

(c) in preparations for cosmetic use containing 100 mg/kg or less of lead;

(d) in pencil cores, finger colours, showcard colours, pastels, crayons, poster paints/colours or coloured chalks containing 100 mg/kg or less of lead; or

(e) in ceramic glazes when labelled with the warning statement: *CAUTION—Harmful if swallowed. Do not use on surfaces which contact food or drink.* Written in letters not less than 1.5 mm in height.'

and

'CHROMATES (including dichromates) except in paints or tinters containing 5 per cent or less of chromium as the ammonium, barium, potassium, sodium, strontium or zinc chromate calculated on the non-volatile content of the paint or tinter.

Schedule 6 chemicals are labelled with 'Poison'. These are substances with a moderate potential for causing harm, the extent of which can be reduced by using distinctive packaging with strong warnings and safety directions on the label.

Schedule 5

LEAD COMPOUNDS in preparations for use as hair cosmetics, unless specified in Appendix C.

Schedule 5 substances are considered to have low potential for causing harm, the extent of which can be reduced through the use of appropriate packaging with simple warnings and safety directions on the label.

The chemicals in this group are also subject to additional restrictions as described in the appendices of the above standard:

Appendix C

LEAD COMPOUNDS in paints, tinters, inks or ink additives except in preparations containing 0.1 % or less of lead calculated on the non-volatile content of the paint, tinter, ink or ink additive.

Appendix C substances, other than those included in Schedule 9, are considered of such danger to health as to warrant prohibition of sale, supply and use. These substances are poisons prohibited from sale, supply or use because of their known potential for harm to human and/or animal health.

Appendix I, Uniform Paint Standard

Lead compounds are not permitted to be used in domestic or industrial paints at greater than 0.1 %.

Chromium compounds (as chromates of ammonia, barium, potassium, sodium, strontium or zinc) are not permitted to be used in paints at >5 % for application to:

'(1) a roof or any surface to be used for the collection or storage of potable water; or

(2) furniture; or

(3) any fence, wall, post, gate or building (interior or exterior) other than a building which is used exclusively for industrial purposes or mining or any oil terminal; or

(4) any premises used for the manufacture, processing, preparation, packing or serving of products intended for human or animal consumption ...

...The proportion of a substance for the purposes of this Schedule is calculated as a percentage of the element present in the non-volatile content of the paint.' (SUSMP, 2013).

Customs Prohibitions

Under the Customs (Prohibited Imports) Regulations 1956, the importation of cosmetic products containing more than 250 mg/kg (0.025 % w/w) of lead or lead compounds (calculated as lead), except products containing more than 250 mg/kg of lead acetate designed for use in hair treatments, is prohibited unless written permission is granted by the Minister (Australian Government, 2013).

International

The chemicals in this group are listed on the following (Galleria Chemica):

- EU Cosmetics Regulation 1223/2009 Annex II—List of substances prohibited in cosmetic products;
- New Zealand Cosmetic Products Group Standard—Schedule 4: Components cosmetic products must not contain;
- Health Canada List of prohibited and restricted cosmetic ingredients (The Cosmetic Ingredient "Hotlist"); and
- Association of Southeast Asian Nations (ASEAN): Cosmetic Directive Annex II, Part 1: List of substances which must not form a part of the composition of cosmetic products.

Lead and lead compounds are also restricted by Annex XVII to the REACH Regulations, 'The chemicals cannot be used in substances and preparations placed on the market or used in any individual part of jewellery articles if the concentration of lead is equal to or greater than 0.05 % by weight'.

Existing Worker Health and Safety Controls

Hazard Classification

The chemicals, C.I. Pigment Yellow 34 (CAS No. 1344-37-2), C.I. Pigment Red 104 (CAS No. 12656-85-8) and lead chromate (CAS No. 7758-97-6) are classified as hazardous, with the following risk phrases for human health in the Hazardous Substances Information System (HSIS) (Safe Work Australia):

Carc. Cat. 2: R45 (Carcinogenicity—may cause cancer)

Repr. Cat. 1: R61 (Reproductive toxicity—may cause harm to the unborn child)

Repr. Cat. 3; R62 (Reproductive toxicity—possible risk of impaired fertility)

R33 (Danger of cumulative effects)

Exposure Standards

Australian

The chemical, lead chromate (CAS No. 7758-97-6) has an exposure standard of 0.05 mg/m^3 time weighted average (TWA) (Safe Work Australia).

The remaining chemicals in this group are listed in HSIS as 'Chromium (VI) compounds (as Cr), certain water insoluble (h)' and have an exposure standard of 0.05 mg/m^3 time weighted average (TWA) (Safe Work Australia).

International

The following exposure standards are identified (Galleria Chemica):

- An exposure limit (TWA) of 0.012–0.1 mg/m^3 in different countries such as USA (Alaska, Hawaii), Canada (Yukon), Spain, Germany, Norway and Switzerland.

Health Hazard Information

The hazard properties of both lead and chromate contribute to the key health hazards of this chemical group. These health hazards are the same as those identified in the NICNAS assessments of selected lead-based pigments, and chromates and dichromates (insoluble) (NICNASa; NICNASb).

Insoluble chromates are acutely toxic via the oral and inhalation routes; may cause sensitisation by skin contact; may cause harmful effects following repeated exposure via the inhalation route; and are carcinogenic (NICNAS a). Hazards of selected lead-based pigments may cause harmful effects following repeated exposure via the oral route; i.e. genotoxicity, carcinogenicity and reproductive and developmental toxicity (NICNAS b).

In the absence of data on chemicals in this group, data from selected lead-based pigments and chromates and dichromates (insoluble) are used as 'read-across'.

Toxicokinetics

The bioavailability of lead chromate and lead-chromate-derived pigments are limited based on their low solubility. Lead chromate (CAS No. 7758-97-6) is considered relatively insoluble (Reeder et al., 2006).

Oral administration of non-encapsulated or silica-encapsulated chrome yellow/lead chromate to rats resulted in an increased level of lead in the blood and kidneys. No chromium was observed above the detection limit (10ug/L) in the blood of exposed rats. Significantly increased levels of chromium could only be found in the liver of rats treated with non-encapsulated pigment.

Whole body inhalation of lead chromate in rats resulted in the accumulation of both chromium and lead chromate in the lungs. Chromium and lead levels in blood were only slightly elevated, although chromium concentrations in the urine and faeces were significantly increased following exposure (Government of Canada, 2008).

Once absorbed, the chromium component is excreted rapidly, although the lead component can be stored in bone and be released into the blood after exposure has ceased. Small amounts of lead that can be absorbed by any route may be sufficient to lead to chronic effects (NICNASa, b).

Workers exposed to lead chromate by inhalation had significantly increased levels of chromium in their urine and increased levels of lead in their blood compared with non-occupationally exposed persons (Government of Canada, 2008).

Acute Toxicity

Oral

The chemicals, C.I. Pigment Yellow 34 (CAS No. 1344-37-2) and lead chromate (CAS No. 7758-97-6) were of low acute toxicity in animal tests following oral exposure. The median lethal dose (LD50) of exposure to C.I. Pigment Yellow 34 (CAS No. 1344-37-2) in rats was >5000 mg/kg bw. The LD50 for exposure to lead chromate (CAS No. 7758-97-6) in mice was >12000 mg/kg bw (Government of Canada, 2008).

Dermal

No data are available for chemicals of this group. However, using data from chromate and dichromate (insoluble) compounds (NICNASa) and selected lead-based pigments (NICNASb), the group of chemicals being assessed does not warrant hazard classification for acute dermal toxicity due to low dermal absorption of these chemicals.

Inhalation

No data are available for chemicals of this group. Using data from chromates and dichromates (insoluble) compounds (NICNASa), the group of chemicals being assessed warrant hazard classification for acute inhalation toxicity (refer to **Recommendation** section).

Corrosion / Irritation

Respiratory Irritation

The chemicals in this group are not respiratory irritants.

Using data from chromates and dichromates (insoluble) compounds (NICNASa) and selected lead-based pigments (NICNASb), the group of chemicals being assessed do not warrant hazard classification for respiratory irritation.

Skin Irritation

The chemicals in this group are not skin irritants.

The chemical, C.I. Pigment Yellow 34 (CAS No. 1344-37-2) produced no skin irritation in studies performed in accordance with the OECD Test Guideline (TG) 404 (REACH). Furthermore, using data from chromates and dichromates (insoluble) compounds (NICNASa) and selected lead-based pigments (NICNASb), the group of chemicals being assessed do not warrant hazard classification for skin irritation.

Eye Irritation

The chemicals in this group are not eye irritants.

The chemical, C.I. Pigment Red 104 (CAS No. 12656-85-8) was reported to slightly irritate the eyes when tested according to TG 405. The average scores for cornea, iris, conjunctivae (redness) and conjunctivae (chemosis) were given as 0.44/0/1.25/0.67, respectively. These effects were reversible within 72 hours (REACH).

Furthermore, using data from chromates and dichromates (insoluble) compounds (NICNASa) and selected lead-based pigments (NICNASb), the group of chemicals being assessed do not warrant hazard classification for eye irritation.

Sensitisation

Skin Sensitisation

No data are available. Using data from chromates and dichromates (insoluble) compounds (NICNASa), the group of chemicals being assessed do warrant hazard classification for skin sensitisation (refer to **Recommendation** section).

Repeated Dose Toxicity

Oral

The chemicals, C.I. Pigment Yellow 34 (CAS No. 1344-37-2), C.I. Pigment Red 104 (CAS No. 12656-85-8) and lead chromate (CAS No. 7758-97-6) are classified as hazardous with the risk phrase 'Danger of cumulative effects' (R33) in HSIS (Safe Work Australia). This classification is supported based on toxicokinetic data on the accumulation of lead (refer to **Toxicokinetics** section) from studies on lead chromate and using data from selected lead-based pigments (NICNASb) (refer to **Recommendation** section).

In a repeated dose toxicity study similar to OECD TG 409, the lowest observed adverse effect level (LOAEL) of 75.4 mg/kg bw/day determined from a 90-day study in beagle dogs (C.I. Pigment Yellow 34—CAS No. 1344-37-2) was based on haematological changes and lesions involving the kidney, bone marrow, intestines and liver (REACH).

In another 90-day oral gavage study in male and female Sprague Dawley rats, a LOAEL of 1600 mg/kg bw/day was reported after exposure to C.I. Pigment Yellow 34 (CAS No. 1344-37-2). Effects observed at this concentration included a statistically elevated kidney to body weight ratio, and liver to body weight ratio, in males. (REACH).

Dermal

No data are available. Given the low dermal absorption expected based on insoluble chromium (VI) and selected lead-based pigments, the chemicals in this group are not expected to be harmful by repeated dermal exposure.

Inhalation

No data are available. Using data from chromates and dichromates (insoluble) compounds (NICNASa), the group of chemicals being assessed do warrant hazard classification for repeat dose inhalation toxicity (refer to **Recommendation** section).

Genotoxicity

The chemicals in this group are suspected of causing genetic defects.

The chemicals, C.I. Pigment Yellow 34 (CAS No. 1344-37-2), C.I. Pigment Red 104 (CAS No. 12656-85-8) and lead chromate (CAS No. 7758-97-6) were positive in several in vitro assays (Ames test, chromosomal aberration test, sister chromatid exchange test). In an in vivo study, a positive result was reported for micronuclei induction in C57B1/6N mouse bone marrow cells following intra-peritoneal injection with lead chromate (CAS No. 7758-97-6) (Government of Canada, 2008).

Furthermore, using data from both chromates and dichromates (insoluble) and selected lead-based pigments (NICNASb), the group of chemicals being assessed do warrant hazard classification for genotoxicity (refer to **Recommendation** section).

Carcinogenicity

The chemicals, C.I. Pigment Yellow 34 (CAS No. 1344-37-2), C.I. Pigment Red 104 (CAS No. 12656-85-8) and lead chromate (CAS No. 7758-97-6) are classified as hazardous—Category 2 carcinogenic substance—with the risk phrase 'May cause cancer' (T; R45) in HSIS (Safe Work Australia).

Based on the available data from chromates and dichromates (insoluble) (NICNASa), selected lead-based pigments (NICNASb), the US National Toxicology (NTP, 2014) 13th Report and the US Californian Proposition 65 (OEHHA, 2016) on lead and lead compounds, the above classification is supported.

Reproductive and Developmental Toxicity

Lead and lead compounds are listed as known to cause reproductive and developmental toxicity, with the maximum allowable dose level (MADL) of 0.5 - 8.2 μg/day (OEHHA, 2013; Galleria).

Using data from selected lead-based pigments (NICNASb), the group of chemicals being assessed do warrant hazard classification for reproductive and developmental toxicity, particularly the effects on neurodevelopment (refer to **Recommendation** section).

Risk Characterisation

Critical Health Effects

The critical health effects for risk characterisation include systemic long-term effects (carcinogenicity, genotoxicity, reproductive toxicity and developmental toxicity), systemic acute effects (acute toxicity from inhalation exposure) and local effects (skin sensitisation). The chemicals may also cause harmful effects following repeated exposure through inhalation and cumulative effects.

Public Risk Characterisation

There are no reported cosmetic or domestic uses in Australia for chemicals in this group. Furthermore, the restrictions on the use of lead compounds in products available to the public in Australia are listed in the Poisons Standard (SUSMP, 2012). These restrictions are sufficient to control risks from domestic use of these chemicals.

Historical use of lead compounds in surface coatings suggests that the potential for the public to be exposed, through flaking paint and during home renovation, still exists. While it is possible that the public could be exposed to chemicals in this group, the risk can be managed by following the appropriate guidelines (Australian Standard 4361.2 Guide to Lead Paint Management; Part 2 Residential and Commercial Buildings, 1998).

The chemicals, C.I. Pigment Yellow 34 (CAS No. 1344-37-2) and C.I. Pigment Red 104 (CAS No. 12656-85-8) have been reported to be used in tattoo inks overseas. However, this use has not been confirmed (ECHA, 2010).

Occupational Risk Characterisation

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

Given the critical systemic long-term, systemic acute and local health effects, these chemicals may pose an unreasonable risk to workers unless adequate control measures to minimise dermal, ocular and inhalation exposure to the chemicals are implemented. The chemicals 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 appropriate controls.

The data available support an amendment to the hazard classifications in HSIS (refer to **Recommendation section**).

NICNAS Recommendation

Assessment of these chemicals is considered to be sufficient, provided that the recommended amendments to the classifications are adopted, and labelling and all other requirements are met under workplace health and safety and poisons legislation as adopted by the relevant state or territory.

Regulatory Control

Work Health and Safety

All the chemicals in this group are recommended for classification and labelling under the current approved criteria and adopted GHS as below. This assessment does not consider classification of physical hazards and environmental hazards.

Hazard	Approved Criteria (HSIS)[a]	GHS Classification (HCIS)[b]
Acute Toxicity	Toxic by inhalation (T; R23)	Toxic if inhaled - Cat. 3 (H331)
Sensitisation	May cause sensitisation by skin contact (Xi; R43)	May cause an allergic skin reaction - Cat. 1 (H317)
Repeat Dose Toxicity	Harmful: danger of serious damage to health by prolonged exposure through inhalation (Xn; R48/20) Danger of cumulative effects (R33)*	May cause damage to organs through prolonged or repeated exposure - Cat. 2 (H373)
Genotoxicity	Muta. Cat 3 - Possible risk of irreversible effects (Xn; R68)	Suspected of causing genetic defects - Cat. 2 (H341)
Carcinogenicity	Carc. Cat 2 - May cause cancer (T; R45)*	May cause cancer - Cat. 1B (H350)
Reproductive and Developmental Toxicity	Repro. Cat 3 - Possible risk of impaired fertility (Xn; R62)* Repro. Cat 1 - May cause harm to the unborn child (T; R61)*	May damage the unborn child. Suspected of damaging fertility - Repr. 1A (H360Df)

[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 chemicals should be used according to label instructions.

Advice for industry

Control measures

Control measures to minimise the risk from oral, dermal and inhalation exposure to the chemicals 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 chemicals are used. Examples of control measures which may minimise the risk include, but are not limited to:

- using closed systems or isolating operations;
- using local exhaust ventilation to prevent the chemicals from entering the breathing zone of any worker;
- health monitoring for any worker who is at risk of exposure to the chemicals if valid techniques are available to monitor the effect on the worker's health;
- 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 chemicals.

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 assist with meeting 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 chemicals are prepared; and
- managing risks arising from storing, handling and using hazardous chemicals.

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 these chemicals has not been undertaken as part of this assessment.

References

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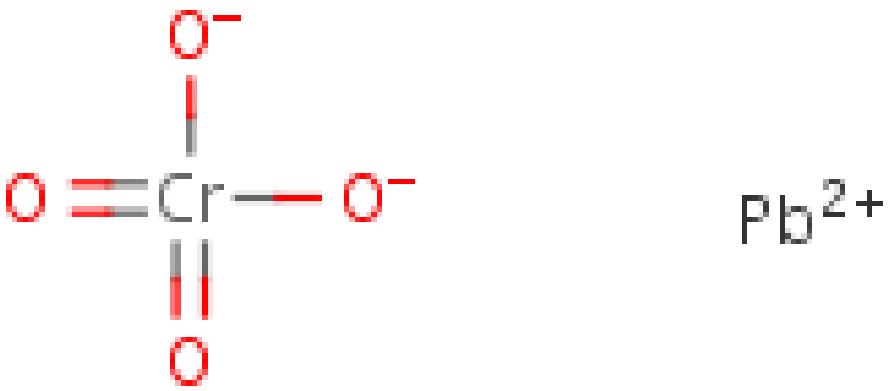
Last Update 24 April 2015

Chemical Identities

Chemical Name in the Inventory and Synonyms	**C.I. Pigment Yellow 34** Lead sulfochromate yellow Chrome yellow middle Pure Lemon Chrome Chromium Yellow

CAS Number	1344-37-2
Structural Formula	No Structural Diagram Available
Molecular Formula	Unspecified
Molecular Weight	N/A

Chemical Name in the Inventory and Synonyms	**Chromic acid (H2CrO4), lead(2+) salt (1:1)** Lead chromate Lead chromate(VI) Plumbous chromate Phoenicochroite
CAS Number	7758-97-6
Structural Formula	

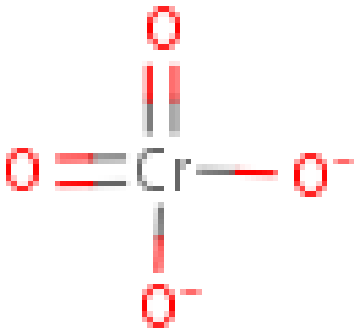
	
Molecular Formula	CrH2O4.Pb
Molecular Weight	323.192

Chemical Name in the Inventory and Synonyms	**Silicic acid, chromium lead salt** lead chromate silicate chromium lead silicate
CAS Number	11113-70-5
Structural Formula	**No Structural Diagram Available**

Molecular Formula	Unspecified
Molecular Weight	

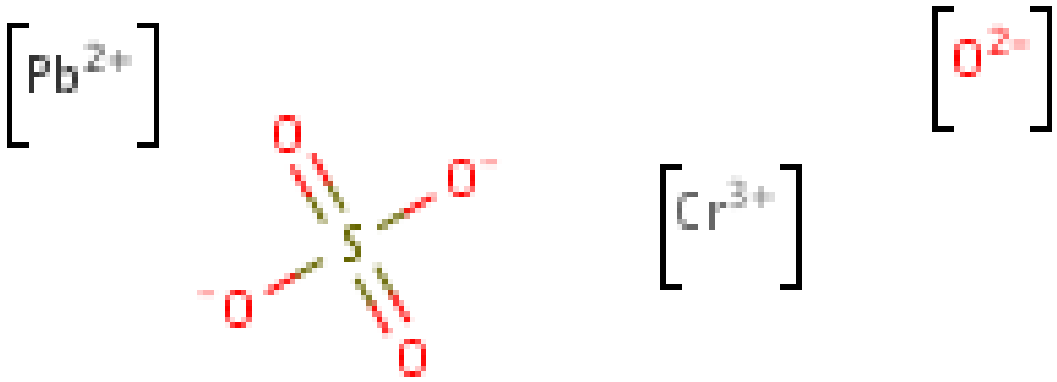
Chemical Name in the Inventory and Synonyms	**C.I. Pigment Red 104** Lead chromate molybdate sulfate red Molybdate orange Chrome vermilion Mineral Fire Red Vynamon Scarlet
CAS Number	12656-85-8
Structural Formula	**No Structural Diagram Available**
Molecular Formula	Unspecified
Molecular Weight	N/A

Chemical Name in the Inventory and Synonyms	**Lead chromate oxide (Pb2(CrO4)O)** Chromic acid (H4CrO5), lead(2+) salt (1:2) Lead chromate(VI) oxide Chromium dilead pentaoxide Chromium lead oxide (CrPb2O5)
CAS Number	18454-12-1
Structural Formula	



Molecular Formula	CrO4.O.Pb
Molecular Weight	546.4

Chemical Name in the Inventory and Synonyms	**Chromium lead oxide sulfate** Lead chromate sulfate
CAS Number	53529-09-2
Structural Formula	

	
Molecular Formula	Unspecified
Molecular Weight	371.257

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