Product Safety Summary
R-M® Color Bases with Lead Chromates-Lead Sulfates

This Product Safety Summary is intended to provide a general overview of the chemical substance. The information on the Summary is basic information and is not intended to provide emergency response information, medical information or treatment information. The summary should not be used to provide in-depth safety and health information. In-depth safety and health information can be found on the Material Safety Data Sheet (MSDS) for the chemical substance.

Chemical Identity

Abbreviation:	$PbCrO_4$ $PbSO_4$
CAS Number:	7758-97-6 7446-14-2 12656-85-8 1344-37-2
Common Names:	Lead Chromate Lead Sulfate Lead chromate molybdate sulfate red (C.I. Pigment Red 104) Lead sulfochromate yellow (C.I. Pigment Yellow 34)

Product Overview

- This report covers both C.I. Pigment Red 104 and C.I. Pigment Yellow 34. However, results and information referring to “lead chromate pigments” are used in some sections.
- The words “lead chromate” or “chrome yellow” or “chrome red” are usually used in literature to describe this whole family of pigments and can be misleading to the composition of the substance.
- C.I. Pigment red 104 (formula Pb(Cr,S,Mo)O4) is a variable solid mixed phase crystal which contains lead chromate, lead sulfate and lead molybdate in varying proportions. This substance is the results of a chemical co-precipitation reaction from other lead and chrome salts.
- C.I. Pigment yellow 34 (formula Pb(Cr,S)O4) is a variable solid mixed phase crystal that contains lead chromate and lead sulfate. This substance is the results of a chemical co-precipitation reaction from other lead and chrome salts.
- BASF’s product names for R-M® Color Bases with Lead Chromates and Lead Sulfates are SC63, SC65, SC70, LB701, LB702 and LB709.
- Lead chromate pigments are manufactured in Europe, Canada, USA, Korea, China, etc. China currently accounts for nearly 50% of the global chromium pigment production.
- The main potential uses of C.I. Pigment Red 104 and Yellow 34 are the coloration in and/or manufacturing of paints, non-consumer paints and coatings, in the areas of motor vehicle paints, treatment and coatings of metals, printing inks, vinyl and cellulose acetate plastics, rubber and plastic formulation for commercial applications, alkyl resin enamels, textile printing, leather finishing, linoleum, artist’s paints and other similar coatings.
- The primary hazard of lead chromates would be through inhalation in the manufacturing process or application of paint products by atomization. As the substance is not volatile, there would be no relevant exposure through the inhalation pathway without atomization. It is possible that a consumer may have dermal contact with the pigments following

application; however, the resulting dermal exposure is expected to be low for several reasons. Lead chromate pigments are often directly incorporated into the matrix of the solid material (i.e., polymer) and generally, solid materials have the lowest potential for exposure by the dermal route as migration through the solid matrix and subsequent absorption through the skin would be very limited. Chromium and lead, and particularly their salts, are not known to have a high potential for systemic exposure by the dermal route.

- The greatest exposure concern with dried coating films containing lead chromates would be from the ingestion of these coating films.
- BASF's R-M® Color Bases with Lead Chromates-Lead Sulfates also contain organic solvents. The hazards associated with these solvents will be inhalation and skin exposure.
- For further safety and health information, the current Material Safety Data Sheet (MSDS) for the individual R-M® product should be referenced. These MSDS will also have the composition of the products.

Physical/Chemical Properties

- Lead chromate and lead sulfate pigments are solid in the form of powders and these particular pigments are either yellow or red.
- The specific gravity of these pigments is over 5.0 and are denser than water and will sink to the bottom of water-filled containers. These pigments are relatively not soluble in water.
- The color bases which contain these pigments have a specific gravity over 1.3 and are also denser than water and will sink to the bottom of water-filled containers.
- Lead chromate and lead sulfate pigments are chemically stable and will not react.

Health Information

Acute Hazards

Lead chromates and lead sulfates pigments are hazardous materials. A thorough knowledge of potential dangers, with strict adherence to recommended safety practices, is essential before these pigments are handled, stored or used. Workers must be properly instructed and supervised in the handling of lead chromates and lead sulfates. The primary hazard with these pigments is the inhalation of dust particles. Limits have been established for lead chromates and the OSHA limits are CLV is 0.1 mg/m^3; TWA is 0.05 mg/m^3 and OSHA action level is .03 mg/m^3. For Chromium (Cr) the OSHA exposure limits are PEL is 1 mg/m^3, TWA is .005 mg/m^3 and OSHA action level is .0025 mg/m^3.

Effects on Respiratory System:

Repeated exposure to lead chromates and lead sulfates by inhalation of dust or mist may result in lead poisoning. Inhalation exposure may cause embryo toxicity and teratogenicity. Lead chromates are a known carcinogen.

Effects on Eyes:

Exposure to lead chromate or lead sulfate pigments may cause mild irritation and watering of the eyes from the dust particle.

Effects on Skin:

There a no known skin irritation effects, but someone could develop skin discoloration or dryness to repeated or prolonged contact. Direct contact may produce contact dermatitis and eczema from repeated exposures.

Effects on Ingestion:
Proportions of the pigment substance dissolve in hydrochloric acid at gastric acid concentration. Long term exposure to high concentrations of heavy metals can lead to an inhibition of hemoglobin biosynthesis, as well as to other effects. The pigment substance can accumulate in the body.

Chronic Hazards
Lead chromates and lead sulfates meet the criteria for classification as carcinogenic (category 1 or 2) or as toxic for reproduction (category 1 or 2). The European Commission has concluded that C.I. Pigment Red 104, together with C.I Pigment Yellow 34 and lead chromate show(s) evidence for carcinogenicity in several studies with rats after subcutaneous and intramuscular administration. Lead chromate induced both benign and malignant tumors at the site of injection and, in one study, renal carcinomas. The animal studies are supported by epidemiological studies demonstrating an increased frequency of lung cancer among workers involved in production of chromate pigments. The animal studies are also supported by genotoxic(ity) studies as well as cell transformation studies. The substances show resemblance to known mutagens/carcinogens.

Additional Information

Materials containing Carcinogen, Mutagen, and Reproductive hazard substances as identified by the European Union, including lead chromate pigments and preparations containing them, can not be supplied to private end-users. Preparations with more than 0.15% total lead content must include “Contains lead. Should not be used on surfaces liable to be chewed or sucked by children” on classification, packaging and labeling documents. C.I. Pigment Red 104 and Yellow 104 are not permitted for use in toys or children’s products.

In Europe, the Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of-life vehicles does not allow material and components (as paints) containing lead, mercury, cadmium and hexavalent chromium on vehicles put on the market other than in special cases (exemption for coating inside petrol tanks) after 1 July 2003. But this Directive does not cover the use of paints or coatings containing lead in the bodywork area where old preparations can still be used and old vehicles can be repaired.

Articles in contact with food, whether printed or not, shall be manufactured in accordance with good manufacturing practices, so that under normal conditions of use, they do not transfer their constituent to food in quantities which could endanger human health.

Environmental Information

Lead chromate pigments are not known to be naturally produced in the environment. The principal metallic components of this substance, lead and chromium, are naturally occurring elements and as such are considered infinitely persistent. Lead concentrations in the rock of the upper continental crust have been determined to range between 17 and 20 ppm; chromium concentrations have been determined to be approximately 35 ppm. Lead chromate pigments are used in many specific colored products, in a dispersive way.
They can be released into the environment mainly as a result of industrial use and service life of these colored products.

Exposure Potential

Exposure to the general public may occur in accidental situations. Lead chromates/sulfates or products containing lead chromates/sulfates are not intended for the general use by the general public.

Use of lead chromate pigments is banned for the manufacture of preparations for use by the general population. Lead chromate pigments are however used in commercial settings to manufacture a wide range of articles and preparations that are sold throughout that may come in contact with each consumer (the whole general population including children). They could be potentially exposed to those articles (paints, pigmented polymers, plastics, rubbers and pigments used in wiring. Pigments concentration in final industrial paints can range from 5% to 40% by weight. As the substance is not volatile, there would be no relevant exposure through the inhalation pathway. It is possible that a consumer may have dermal contact with the pigments following application; however, the resulting dermal exposure is expected to be low for several reasons.

Based on the properties and uses previously described of the substance, the actual environmental exposure levels are expected to be low. There are no empirical data identified regarding measured concentrations of lead chromate pigments in environmental media (i.e., air, water, soil and food). Given the physical and chemical properties and sources of this substance, the Canadian screening assessment concluded that exposure to lead chromate pigments is expected to be negligible via drinking water and ambient air. Main exposure of general population from the environment is supposed predominantly from soils, even if it is expected to be low due to the primarily commercial use of the substance, very limited industrial releases, and the encapsulation and incorporation of the substance into a solid matrix. However, these exposures could not be quantified due to lack of measured concentrations.

The guidelines established by OSHA, ACGIH, NIOSH and others, represent current thinking and are believed to be conservative and protective of occupational workers. There is not guarantee of absolute safety.

Risk Management

The potential hazards associated with lead chromates/sulfates can be avoided if workers are adequately instructed in supervised on the proper procedures of handling lead chromates/sulfates.

Every worker should be trained to realize that exposure to a hazardous chemical requires immediate washing of affected areas using large amounts of soap and water, and that immediate attention may markedly decrease the severity of any health effects. (See First Aid.) Do not wash affected area with solvents.

Protective clothing, gloves, boots and eye protection must be worn whenever there is any possibility of lead chromates/sulfates exposure. Protective clothing shall be made of impervious materials. Soiled or contaminated clothing should be laundered or destroyed.

Proper respiratory protective equipment should be readily available and in good working order. Exhaust and ventilating equipment should be inspected and tested regularly to assure lead chromates/sulfates particles/aerosols are being controlled to acceptable levels.

Properly designed emergency showers and eyewash fountains should be placed in convenient locations wherever lead chromates/sulfates is used. All employees should know the location and

operation of this equipment. All equipment must be frequently inspected to make sure they are in proper working condition.

Federal/Science Findings

U.S. Environmental Protection Agency – Integrated Risk Information System (IRIS)
Lead - http://www.epa.gov/ncea/iris/subst/0277.htm
Chromium VI - http://www.epa.gov/ncea/iris/subst/0144.htm

U.S Department of Labor – Occupational Safety and Health Administration (OSHA)
Lead - http://www.osha.gov/SLTC/lead/index.html
Chromium VI - http://www.osha.gov/SLTC/hexavalentchromium/index.html

American Conference of Governmental Industrial Hygienists (ACGIH)
http://www.acgih.org/home.htm

National Institute for Occupational Safety and Health (NIOSH)
Lead - http://www.cdc.gov/niosh/topics/lead
Chromium VI - http://www.cdc.gov/niosh/topics/hexchrom
Chromium - http://www.cdc.gov/niosh/topics/chromium

Contact Information

http://www.basf.com
http://basfrefinish.com

MSDS

http://basfrefinish.com

References

BASF Sicomin MSDS sheets, 2005 - 2009
ECHA Proposal for identification of a substance as a CMR cat 1 or 2, PBT, vPvB or a substance of an equivalent level of concern - Lead chromate molybdate sulfate red (C.I. Pigment Red 104), August 2009.
ECHA SVHC Support Document - Lead sulfochromate yellow (C.I. Pigment Yellow 34), November 2009.