Merck Animal Health
One Merck Dr.
Whitehouse Station, NJ 08889

MATERIAL SAFETY DATA SHEET

Merck Animal Health urges each user or recipient of this MSDS to read the entire data sheet to become aware of the hazards associated with this material.

SECTION 1. IDENTIFICATION OF SUBSTANCE AND CONTACT INFORMATION

MSDS NAME: **Coccidiosis Vaccines**

SYNONYM(S): Coccidiosis Vaccine
Coccivac-B
Coccivac-T
Coccivac-D

MSDS NUMBER: SP000831

EMERGENCY NUMBER(S): (908) 423-6000 (24/7/365) English Only
Emergencies - CHEMTREC:
(800) 424-9300 (Inside Continental USA)
(703) 527-3887 (Outside Continental USA)

INFORMATION: Animal Health Technical Services:
For Small Animals and Horses: (800) 224-5318
For Livestock: (800) 211-3573
For Poultry: (800) 219-9286

MERCK MSDS HELPLINE: (800) 770-8878 (US and Canada)
(908) 473-3371 (Worldwide)
Monday to Friday, 9am to 5pm (US Eastern Time)

SECTION 2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Liquid
Yellow-brown
Odor unknown
May cause cancer.
May be a mutagen.
May cause impaired fertility.
May cause developmental effects.
Toxic by inhalation.
Harmful if swallowed.
May cause sensitization by inhalation or skin contact.
May be irritating to eyes, skin or respiratory tract.
Prolonged exposure may cause serious health effects.
May cause effects to:
respiratory system
gastrointestinal tract
liver
kidney
reproductive system
fetus
Toxic to fish and aquatic organisms.
May cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS:

The toxicological properties of the mixture(s) have not been fully characterized in humans or animals. However, there are data to describe the toxicological properties of the individual ingredients. The following summary is based upon available information about the individual ingredients of the mixture(s), or of the expected properties of the mixture(s).

Potassium dichromate is corrosive to any tissue with which it comes into contact. Acute inhalation of the dust or mist can produce irritation of the nose, eyes, and respiratory tract, sneezing, throat redness, nasal septum lesions, or bronchospasm. Portassium dichromate can be absorbed by any exposure route and may cause systemic effects. Acute effects that may result from ingestion include abdominal and esophageal pain, vomiting, gastrointestinal bleeding, respiratory distress, cyanosis, coma, and death. Potassium dichromate is a common skin sensitizer following repeated exposure. Chronic skin contact may produce allergic contact dermatitis with deep ulcers. Long-term inhalation exposure to potassium dichromate may cause chronic rhinitis, coughing, wheezing, dyspnea, asthma, perforation of the nasal septum, and mucous membrane injury. Hexavalent chromium, class of compounds to which potassium dichromate belongs, have been shown to cause liver and kidney damage with chronic occupational exposure.

Epidemiological studies have consistently shown excess risks for lung cancer in workers involved in chromate or chromate pigment production. The epidemiological studies do not clearly implicate specific chromium compounds, but implicate the class of hexavalent chromium (chromium [VI]) compounds, to which potassium dichromate belongs. IARC has concluded that there is sufficient evidence in humans for the carcinogenicity of hexavalent chromium compounds. Hexavalent chromium compounds have also been shown to be consistently genotoxic in various studies and assays, and causes developmental and reproductive effects in animals.

LISTED CARCINOGENS

INGREDIENT	CAS NUMBER	OSHA	IARC	NTP	ACGIH
Potassium dichromate	7778-50-9	X	1	K	

Potassium dichromate: IARC has classified potassium dichromate as a Group 1 (carcinogenic to humans).

Chromium [VI] Compounds: ACGIH has classified chromium [VI] compounds as Group A1 (confirmed human carcinogen), and NTP has classified the compounds as Group K (known to be a human carcinogen).

SECTION 3. COMPOSITION AND INFORMATION ON INGREDIENTS

PRODUCT USE: Vaccine

CLASS: Parasite (Eimeria)

CHEMICAL FORMULA: Mixture.

The formulations for these products are proprietary information. These formulations have the same hazardous profile; however, the presence of hazardous ingredients may vary by formulation. Only hazardous ingredients in concentrations of 1% or greater and/or carcinogenic ingredients in concentrations of 0.1% or greater are listed in the Chemical Composition table. Active ingredients in any concentration are listed. For additional information about carcinogenic ingredients see Section 2.

CHEMICAL COMPOSITION

INGREDIENT	CAS NUMBER	PERCENT
Eimeria acervulina		Varies
Eimeria brunetti		Varies
Eimeria hagani		Varies
Eimeria maxima		Varies
Eimeria mivati		Varies
Eimeria necatrix		Varies
Eimeria tenella		Varies
Eimeria adenoides		Varies
Eimeria dispersa		Varies
Eimeria gallopavonis		Varies
Eimeria meleagrimitis		Varies
Potassium dichromate	7778-50-9	<3

ADDITIONAL INFORMATION: This MSDS is written to provide health and safety information for individuals who will be handling the final product formulation during research, manufacturing, and distribution. For health and safety information for individual ingredients used during manufacturing, refer to the appropriate MSDS for each ingredient. Refer to the package insert or product label for handling guidance for the consumer.

SECTION 4. FIRST AID MEASURES

INHALATION: Remove to fresh air. Administer artificial respiration if breathing has ceased. IMMEDIATELY consult a physician.

SKIN CONTACT: In case of skin contact, IMMEDIATELY flush exposed skin thoroughly with plenty of water. While wearing protective gloves, remove any contaminated clothing, including shoes and continue to wash skin thoroughly with soap and water for at least 15 minutes. Get IMMEDIATE medical attention. Treat symptomatically.

EYE CONTACT: In case of eye contact, immediately rinse eyes thoroughly with plenty of water. If wearing contact lenses, remove only after initial rinse, and continue rinsing eyes for at least 15 minutes. If irritation occurs or persists, consult a physician.

INGESTION: Do not induce vomiting unless under the direction of a qualified medical professional or Poison Control Center. IMMEDIATELY consult a physician. Do not attempt to give anything by mouth to a seizing, drowsy or unconscious person. If alert, rinse mouth and drink a glass of water.

NOTE TO PHYSICIAN: This product is a vaccine. Accidental injection may cause local swelling, irritation or necrosis at the injection site.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABILITY DATA:

Flash Point: Not determined (liquids) or not applicable (solids).

SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing and self-contained breathing apparatus (SCBA).

SUITABLE EXTINGUISHING MEDIA:
Carbon dioxide (CO2), extinguishing powder or water spray.

See Section 9 for Physical and Chemical Properties.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:
Wear appropriate personal protective equipment as specified in Section 8. Keep personnel away from the clean-up area.

SPILL RESPONSE / CLEANUP:
All spills should be handled according to site requirements and based on precautions cited in the MSDS. In the case of liquids, use proper absorbent materials. For laboratories and small-scale operations, incidental spills within a hood or enclosure should be cleaned by using a HEPA filtered vacuum or wet cleaning methods as appropriate. For large dry or liquid spills or those spills outside enclosure or hood, appropriate emergency response personnel should be notified. In manufacturing and large-scale operations, HEPA vacuuming prior to wet mopping or cleaning is required.

ENVIRONMENTAL PRECAUTIONS:
This product is toxic to aquatic organisms. Do not allow product to reach ground water, water course, sewage or drainage systems.

See Sections 9 and 10 for additional physical, chemical, and hazard information.

SECTION 7. HANDLING AND STORAGE

HANDLING:
Keep containers adequately sealed during material transfer, transport, or when not in use. Wash face, hands, and any exposed skin after handling. Do not eat, drink, or smoke when using this substance or mixture.

Appropriate handling of this material is dependent on many factors, including physical form, duration and frequency of process or task, and effectiveness of engineering controls. Site-specific risk assessments should be conducted to determine the feasibility and the appropriateness of all exposure control measures. See Section 8 (Exposure Controls) for additional guidance.

STORAGE:
Store in a cool, dry, well ventilated area.

SPECIAL PRECAUTIONS:
Avoid self-inoculation or needle sticks.

See Section 8 for exposure controls and additional safe handling information.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

EXPOSURE CONTROLS
The health hazard risks of handling this material are dependent on many factors, including physical form, duration and frequency of process or task, and effectiveness of engineering controls. Site-specific risk assessments should be conducted to determine the feasibility and the appropriateness of all exposure control measures. Exposure controls for normal operating or routine procedures follow a tiered strategy. Engineering controls are the preferred means of long-term or permanent exposure control. If engineering controls are not feasible, appropriate use of personal protective equipment (PPE) may be considered as alternative control measures. Exposure controls for non-routine operations must be evaluated and addressed as part of the site-specific risk assessment.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):

Respiratory Protection:	Respiratory protective equipment (RPE) may be required for certain laboratory and large-scale manufacturing tasks if potential airborne breathing zone concentrations of substances exceed the relevant exposure limit(s). Workplace risk assessment should be completed before specifying and implementing RPE usage. Potential exposure points and pathways, task duration and frequency, potential employee contact with the substance, and the ability of the substance to be rendered airborne during specific tasks should be evaluated. Initial and ongoing strategies of quantitative exposure measurement should be obtained as required by the workplace risk assessment. All RPE must conform to local and regional specifications for efficacy and performance. Consult your site or corporate health and safety professional for additional guidance.
Skin Protection:	Gloves that provide an appropriate barrier to the skin are recommended if there is potential for contact with this material. Consult your site safety staff for guidance.
Eye Protection:	Safety glasses with side shields. Use of goggles or full face protection may be required based on hazard, potential for contact, or level of exposure. Consult your site safety staff for guidance.
Body Protection:	In small-scale or laboratory operations, lab coats or equivalent protection is required. Disposable Tyvek or other dust impermeable suit should be considered based on procedure or level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance. In large-scale or manufacturing operations, disposable Tyvek or other dust impermeable suit is recommended and based on level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance.

EXPOSURE LIMIT VALUES

INGREDIENT	CAS NUMBER	ACGIH TLV (TWA)	OSHA PEL (TWA)
Potassium dichromate	7778-50-9	0.05 mg/m³	5 µg/m³

INGREDIENT	CAS NUMBER	ACGIH TLV (STEL / SKIN)	ACGIH TLV (CEIL)	OSHA PEL (STEL / SKIN)	OSHA PEL (CEIL)
Potassium dichromate	7778-50-9				0.1 mg/m³

Chromium [VI] Compounds: ACGIH TLV (TWA): 0.05mg/m³ OSHA PEL (STEL/CEIL): 0.1 mg/m³

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

FORM: Liquid
COLOR: Yellow-brown
ODOR: Odor unknown
SOLUBILITY:
Water: Not determined

See Section 5 for flammability/explosivity information.

SECTION 10. STABILITY AND REACTIVITY

STABILITY/ REACTIVITY:
Stable under normal conditions.

INCOMPATIBLE MATERIALS / CONDITIONS TO AVOID:
None known.

HAZARDOUS DECOMPOSITION PRODUCTS / REACTIONS:
No dangerous decomposition is expected if used according to manufacturer's specifications.

SECTION 11. TOXICOLOGICAL INFORMATION

The toxicological properties of the mixture(s) have not been fully characterized in humans or animals. The information presented below pertains to the following individual ingredients, and not to the mixture(s).

ACUTE TOXICITY DATA

SKIN:
Potassium Dichromate: Dermal LD50: 14 mg/kg (rabbit)
A single application of 0.5% potassium dichromate (0.175% chromium(VI)) to the shaved skin of rats resulted in increased levels of serotonin in the liver, decreased activities of acetylcholinesterase and cholinesterase in the plasma and erythrocytes, increased levels of acetylcholine in the blood, and increased glycoprotein hexose in the serum. These effects may indicate alterations in carbohydrate metabolism.

ORAL:
Potassium Dichromate: Oral LD50: 25 mg/kg (rat)

DERMAL AND RESPIRATORY SENSITIZATION:
Potassium dichromate has been shown to be sensitizing to mice and guinea pigs in various studies.

ADDITIONAL INFORMATION:
Potassium dichromate produced kidney effects (inflammation) in rabbits and kidney damage in dogs when administered subcutaneously at doses of 0.8-2 mg or 17 mg, respectively.

REPEAT DOSE TOXICITY DATA

SUBCHRONIC / CHRONIC TOXICITY:
Mice were given drinking water containing 25, 50, & 100 mg/l of chromium as potassium dichromate for 1 yr. Body weight increases were observed in low- and mid-dose groups; however, no increases were observed in the high-dose group. Decreases in hemoglobin and red blood cells, and decreases in cholesterol and increases in glutamic-pyruvic transaminase were observed; however, these effects were not dose-related.

Significant increased incidences of pulmonary lesions (lung abscesses, bronchopneumonia, giant cells, & granulomata) found in rats exposed chronically to a finely ground, mixed chromium roast material that resulted in airborne concentrations of 1.6-2.1 mg chromium(VI)/m³. In the same study, guinea pigs were exposed chronically to the chromium roast material along with mists of potassium dichromate that also resulted in 1.6-2.1 mg chromium(VI)/m³. Significant increased incidences of alveolar and interstitial inflammation, alveolar hyperplasia, and interstitial fibrosis were observed. Simiarly, rabbits were also exposed and had pulmonary lesions similar to those seen in the rats and guinea pigs.

REPRODUCTIVE / DEVELOPMENTAL TOXICITY:
Common reproductive effects observed in mice and rats administered doses ranging from 45 to 180 chromium/kg/day as potassium dichromate in drinking water before or during gestation include significant reductions in the number of follicles at different stages of maturation, reductions in the number of ova/mice, significant increases in the estrus cycle duration, decreases in the number of corpora lutea, histological alterations in the ovaries (e.g. proliferated, dilated, and congested blood vessels, pyknotic nuclei in follicular cells, and atretic follicles), decreases in implantations, increases in preimplantation and postimplantation loss, increases in resorptions, decreases in litter size, and placental weight decreases. Fetal effects observed at doses of 98 mg chromium (VI)/kg/day and greater included increased numbers of sub-dermal hemorrhagic patches, kinky short tails, decreased fetal body weights, decreased crown-rump length, reduction in ossification in caudal, parietal, and interparietal bones. The severity of the reproductive and fetal effects appeared to be dose-related.

MUTAGENICITY / GENOTOXICITY:
Chromium [VI] compounds, to which potassium dichromate belongs, have been shown to be consistently genotoxic, inducing a wide variety of effects such as DNA damage, gene mutation, sister chromatid exchange, chromosomal aberrations, cell transformation, and dominant lethal mutations.

Potassium dichromate has been shown to induce mutations in the Ames Salmonella assay, in yeast, and in mammalian cells, including crossing over in microbes and sister chromatid exchanges, increased chromosome aberrations, inhibition of DNA synthesis and repair, and induction of dominant lethal mutations in mice.

CARCINOGENICITY:
This material or product has not been evaluated for carcinogenicity.

In rats, potassium dichromate by bronchial implantation did not produce an increase in lung tumors. However, epidemiological studies from around the world have consistently shown excess risks of lung cancer in workers involved in chromate and chromate pigment production. The studies do not clearly implicate specific chromium compounds, but implicate the class of compounds, chromium [VI] compounds, to which potassium dichromate belongs. IARC has concluded that there is sufficient evidence in humans for the carcinogenicity of chromium [VI] compounds.

SECTION 12. ECOLOGICAL INFORMATION

There are no data for the final product or its formulation(s). The information presented below pertains to the following ingredient(s).

ECOTOXICITY DATA

INGREDIENT ECOTOXICITY

Potassium dichromate: 48-hr LC50 (daphnid): 0.02-2.7mg/L
96-hr LC50 (rainbow trout): 12.3-27.7 mg/L
72-hr EC50 (green algae): 0.066-1.3 mg/L

ENVIRONMENTAL DATA

There are no environmental data available for the ingredients in the mixture(s).

SECTION 13. DISPOSAL CONSIDERATIONS

MATERIAL WASTE:
This material is classified as a hazardous or special waste and should be disposed of in accordance with applicable federal, state/provincial, and/or local regulations.

PACKAGING AND CONTAINERS:
Disposal must be in accordance with applicable federal, state/provincial, and/or local regulations.

SPECIAL ENVIRONMENTAL HANDLING PROCEDURES:
This product contains materials that are harmful to the environment. Do not allow product to reach ground water, water courses, sewage or drainage systems.

SECTION 14. TRANSPORT INFORMATION

Consult current regulatory guidelines for the appropriate transportation classification and labeling of this material. Refer to site-specific procedures and requirements for additional guidance.

DOT CLASSIFICATION:

Proper Shipping Name:	Toxic, liquid, inorganic, n.o.s. (potassium dichromate)
Hazard Class:	6.1
UN Number:	UN 3287
Packing Group:	III

IATA/ICAO CLASSIFICATION:

Proper Shipping Name:	Toxic, liquid, inorganic, n.o.s. (potassium dichromate)
Hazard Class:	6.1

UN Number: UN 3287
Packing Group: III

ADR CLASSIFICATION:

Marine pollutant by definition.

Proper Shipping Name: Toxic, liquid, inorganic, n.o.s. (potassium dichromate)
Hazard Class: 6.1
UN Number: UN 3287
Packing Group: III
Classification Code: T1

IMDG/IMO CLASSIFICATION:

Marine Pollutant

Proper Shipping Name: Toxic, liquid, inorganic, n.o.s. (potassium dichromate)
Hazard Class: 6.1
UN Number: UN 3287
Packing Group: III

SECTION 15. REGULATORY INFORMATION

TSCA LISTING

INGREDIENT	TSCA
Potassium dichromate	X

U.S. STATE REGULATIONS

INGREDIENT	California Proposition 65	CARTK	NJRTK	CTRTK	MARTK
Potassium dichromate	C D R - F R - M	X	1564		X

INGREDIENT	PARTK	MNRTK	MIRTK	RIRTK
Potassium dichromate	X	X	X	X

SECTION 16. OTHER INFORMATION

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequence of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

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MSDS CREATION DATE: 09-Feb-2005

SUPERSEDES DATE: 23-Sep-2011

SECTIONS CHANGED (US SUBFORMAT): 1, 16
SIGNIFICANT CHANGES (US SUBFORMAT): Phone Number(s), OEB, Transportation