

Material Safety Data Sheet

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1. Identification of the substance/mixture and of the company/undertaking

Product name: KODAK D-19 Developer

Product code: 1464593

Supplier: EASTMAN KODAK COMPANY, 343 State Street, Rochester, New York 14650

For Emergency Health, Safety & Environmental Information, call (585) 722-5151 (USA)

For further information about this product, call (800) 242-2424.

Synonyms: PCD 242

Product Use: photographic processing chemical (developer/activator), For consumer and industrial use.

2. Hazards identification

CONTAINS: Sodium sulphite (7757-83-7), Sodium carbonate, monohydrate (5968-11-6), Hydroquinone (123-31-9), Potassium bromide (7758-02-3), Bis(4-hydroxy-N-methylanilinium) sulphate (55-55-0), Polyphosphoric acids, sodium salts (68915-31-1)

WARNING!

POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURES
MAY LIBERATE SULFUR DIOXIDE
HARMFUL IF INHALED OR SWALLOWED
DUST IRRITATING TO THE EYES AND RESPIRATORY TRACT
CAUSES SKIN AND EYE IRRITATION
REPEATED EXPOSURE TO DUST MAY CAUSE EYE INJURY
MAY CAUSE ALLERGIC SKIN REACTION
MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA
MAY CAUSE KIDNEY DAMAGE BASED ON ANIMAL DATA
MAY CAUSE CYANOSIS BASED ON ANIMAL DATA

HMIS III Hazard Ratings: Health - 2*, Flammability - 1, Physical Hazard - 0

NFPA Hazard Ratings: Health - 3, Flammability - 1, Instability - 0

NOTE: HMIS III and NFPA 704 (2007) hazard indexes involve data review and interpretation that may vary among companies. They are intended only for rapid, general identification of the magnitude of the potential hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

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3. Composition/information on ingredients

Weight percent	Components - (CAS-No.)
55 - 60	Sodium sulphite (7757-83-7)
30 - 35	Sodium carbonate, monohydrate (5968-11-6)
1 - 5	Hydroquinone (123-31-9)
1 - 5	Bis(4-hydroxy-N-methylanilinium) sulphate (55-55-0)
1 - 5	Polyphosphoric acids, sodium salts (68915-31-1)
1 - < 5	Potassium bromide (7758-02-3)
0.1 - < 1	Boric anhydride (1303-86-2)

4. First aid measures

Inhalation: If inhaled, remove to fresh air. Get medical attention.

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes.

Ingestion: If swallowed, DO NOT induce vomiting. Call a physician or poison control centre immediately. Never give anything by mouth to an unconscious person.

Notes to physician:

Treatment: Absorption of this material into the body leads to the formation of methemoglobin that, in sufficient concentration, causes cyanosis. Since reversion of methemoglobin to hemoglobin occurs spontaneously after termination of exposure, moderate degrees of cyanosis need to be treated only by supportive measures such as bed rest and oxygen inhalation. Thorough cleansing of the entire contaminated area of the body, including scalp and nails, is of utmost importance. If cyanosis is severe, intravenous injection of methylene blue, one milligram per kilogram of body weight, may be of value.

5. Fire-fighting measures

Extinguishing Media: Water spray, Carbon dioxide (CO₂), Dry chemical.

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products.

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Hazardous Combustion Products: Carbon oxides, Sulphur oxides, (see also Hazardous Decomposition Products sections.)

Unusual Fire and Explosion Hazards: Dust may form explosive mixture in air.

6. Accidental release measures

Avoid dust formation. Shovel into suitable container for disposal. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: Do not breathe dust at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Use only with adequate ventilation. Wash thoroughly after handling. Do not eat, drink or smoke when using this product.

Prevention of Fire and Explosion: Dust may form explosive mixture in air. Minimize dust generation and accumulation. Use only with adequate ventilation. Keep away from sources of ignition - No smoking. Refer to NFPA 654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids." Keep from contact with oxidizing materials.

Storage: Keep container tightly closed. Keep away from incompatible substances (see Incompatibility section.)

8. Exposure controls/personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Hydroquinone	ACGIH	time weighted average	1 mg/m3
Hydroquinone	OSHA	time weighted average	2 mg/m3

Ventilation: Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. Controls should be sufficient so that applicable occupational exposure limits are not exceeded.

Respiratory protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. Respirator type: full-face cartridge respirator with acid gas cartridge and N95 filter.

A respirator should be worn if hazardous decomposition products are likely to be or have been released. Respirator type: acid gas See Stability and Reactivity Section. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

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Eye protection: Wear safety glasses with side shields (or goggles).

Hand protection: Wear impervious gloves and protective clothing appropriate for the risk of exposure.

9. Physical and chemical properties

Physical form: solid (powder or granules)

Colour: white

Odour: odourless

Specific gravity: 1.13

Vapour pressure (at 20.0 °C (68.0 °F)) : negligible

Vapour density: not applicable

Boiling point/boiling range: 100.0 °C (212.0 °F)

Melting point/range: no data available

Water solubility: appreciable

pH: 10

Flash point: not applicable

10. Stability and reactivity

Stability: Stable under normal conditions.

Incompatibility: Acids, Strong oxidizing agents. Contact with strong acids liberates sulphur dioxide.

Hazardous decomposition products: Sulphur oxides

Hazardous Polymerization: Hazardous polymerisation does not occur.

11. Toxicological information

Effects of Exposure

General advice:

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Contains: Hydroquinone. There is insufficient evidence for classifying hydroquinone as a suspected carcinogenic or mutagenic substance in humans. No increases in cancer rates were observed in an epidemiology study which looked at mortality among more than 800 persons employed primarily in the manufacture of hydroquinone. Carcinogenicity studies in animals were inconclusive. Rats and mice were given hydroquinone by stomach tube or at high concentrations in the diet. Responses were not consistent across route of exposure, species or sex. The International Agency for Research on Cancer (IARC) has classified hydroquinone in Group 3, i.e., "not classifiable" as a carcinogen. Hydroquinone is generally negative in bacterial mutagenicity tests; there is evidence for the clastogenicity (chromosome breakage) of hydroquinone in vivo and in vitro. The relevance of chromosomal effects in test animals in predicting human risk is unclear.

Contains: Potassium bromide. Ingestion of bromide salts can cause nausea, vomiting, headache, irritability, delirium, memory loss, decreased appetite, joint pain, hallucinations, stupor, coma, and acne like rash on face, legs, and trunk.

Contains: Bis(4-hydroxy-N-methylanilinium) sulphate. Based on animal data, may cause adverse effects on the following organs/systems: blood, kidney, spleen. Based on animal data this material can produce methemoglobin which, in sufficient concentration, causes cyanosis, a blue-gray discoloration of the skin and lips caused by a reduced ability of the blood to carry oxygen.

Contains: Polyphosphoric acids, sodium salts. May cause kidney damage based on animal data.

Contains: Boric anhydride. Toxicity evaluation of this chemical is based, in part, on a structurally similar chemical. Based on repeated-dose ingestion studies in animals, may cause adverse reproductive and developmental effects. However, high doses to humans handling this material are not expected since oral consumption is not a likely route of significant exposure.

Inhalation: Harmful if inhaled. Airborne dust/mist/vapor irritating. In contact with strong acids or if heated, sulphites may liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Eyes: Causes eye irritation. Airborne dust/mist/vapor irritating. Repeated exposure to dust may cause eye injury.

Skin: Causes skin irritation. May cause allergic skin reaction based on human experience. May cause skin depigmentation. Prolonged or repeated contact may cause drying, cracking, or irritation.

Ingestion: Harmful if swallowed. May cause burns of the gastrointestinal tract if swallowed. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea.

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Data for Sodium sulphite (CAS 7757-83-7):

Acute Toxicity Data:

Oral LD50 (rat): 820 mg/kg

- Inhalation LC50 (rat): > 5.5 mg/l / 4 hr
- Inhalation LC50 (rat): > 22 mg/l / 1 hr
- Skin irritation: none
- Eye irritation: slight; washing palliative

Data for Sodium carbonate, monohydrate (CAS 5968-11-6):

Acute Toxicity Data:

Oral LD50: 1,600 - 3,200 mg/kg

- Skin irritation: slight

Data for Hydroquinone (CAS 123-31-9):

Acute Toxicity Data:

Oral LD50 (rat): 400 mg/kg

- Oral LD50 (male rat): 400 mg/kg
- Oral LD50 (male mouse): 100 - 200 mg/kg
- Dermal LD50 (guinea pig): > 1,000 mg/kg
- Dermal absorption rate: 1.1 micrograms (s) / cm² / hour
- Skin irritation: slight
- Skin Sensitization (guinea pig): positive
- Eye irritation: moderate

Mutagenicity/Genotoxicity Data:

- Salmonella typhimurium assay (Ames test): negative (in presence and absence of activation)
- Chromosomal aberration assay: negative (in absence of activation)
- Chromosomal aberration assay: positive (in presence of activation)
- Sister chromatid exchange (SCE) assay: positive (in presence and absence of activation)

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Dermal (17-day, rat): NOEL; 3800 mg/kg/day
- Dermal (17-day): Lowest observable effect level; 4800 mg/kg/day

Developmental Toxicity Data:

- Oral (female rabbit): NOEL for developmental toxicity; 25mg/kg/day
- Oral (female rat): NOAEL for developmental toxicity; mg/kg/day

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Data for Potassium bromide (CAS 7758-02-3):

Acute Toxicity Data:

Oral LD50 (rat): > 1,600 mg/kg

- Skin irritation: none

Data for Bis(4-hydroxy-N-methylanilinium) sulphate (CAS 55-55-0):

Acute Toxicity Data:

Oral LD50 (rat): 237 mg/kg

- Oral LD50 (mouse): 565 mg/kg
- Dermal LD50 (guinea pig): > 1,000 mg/kg (highest dose tested)
- Skin irritation: slight
- Skin irritation: slight to moderate (repeated skin application)
- Skin Sensitization: positive
- Eye irritation (unwashed eyes): moderate to strong
- Eye irritation (washed eyes): slight

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Oral (11 days): Lowest observable effect level; 1.0 % in diet (reduced feed intake, reduced body weight gain, target organ effects: red blood cell)
- Oral (11 days): NOEL; 0.1 % in diet

Data for Polyphosphoric acids, sodium salts (CAS 68915-31-1):

Data for Boric anhydride (CAS 1303-86-2):

Acute Toxicity Data:

- Dermal LD50 (rabbit): > 2,000 mg/kg
- Skin irritation: none
- Eye irritation: mild

12. Ecological information

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity:

Toxicity to fish (LC50): 1 - 10 mg/l

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Toxicity to daphnia (LC50):	1 - 10 mg/l
Toxicity to algae (IC50):	10 - 100 mg/l
Toxicity to other organisms (EC50):	> 100 mg/l

Persistence and degradability: Readily biodegradable.

Chemical Oxygen Demand (COD): ca. 180 g/l

Biochemical Oxygen Demand (BOD): ca. 130 g/l

13. Disposal considerations

Discharge, treatment, or disposal may be subject to federal, state, commonwealth, provincial, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

Not regulated for all modes of transportation.

For more transportation information, go to: www.kodak.com/go/ship.

15. Regulatory information

Notification status

Regulatory List	Notification status
TSCA	Not all listed
DSL	Not all listed
NDSL	None listed
EINECS	Not all listed
ELINCS	None listed
NLP	None listed
AICS	All listed
IECS	All listed
ENCS	Not all listed
ECI	Not all listed

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NZIoC All listed

PICCS All listed

"Not all listed" indicates one or more component is either not on the public Inventory or is subject to exemption requirements. If additional information is needed contact Kodak.

Other regulations

American Conference of Governmental Industrial Hygienists (ACGIH):	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans: Hydroquinone
International Agency for Research on Cancer (IARC):	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
U.S. National Toxicology Program (NTP):	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
U.S. Occupational Safety and Health Administration (OSHA):	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
California Prop. 65	This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
U.S. - CERCLA/SARA (40 CFR § 302.4 Designation of hazardous substances):	Hydroquinone
U.S. - CERCLA/SARA - Section 302 (40 CFR § 355 Appendices A and B - The List of Extremely Hazardous Substances and Their Threshold Planning Quantities):	Hydroquinone
U.S. - CERCLA/SARA - Section 313 (40 CFR § 372.65 Toxic Chemical Release Reporting):	Hydroquinone
U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances:	Hydroquinone
U.S. - California - 8 CCR Section 5200-5220 - Specifically	No components found on the California

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Regulated Carcinogens:	Specifically Regulated Carcinogens List.
U.S. - California - 8 CCR Section 5203 Carcinogens:	No components found on the California Section 5203 Carcinogens List.
U.S. - California - 8 CCR Section 5209 Carcinogens:	No components found on the California Section 5209 Carcinogens List.
U.S. - Massachusetts - General Law Chapter 111F (MGL c 111F) - Hazardous Substances Disclosure by Employers (a.k.a. Right to Know Law):	Hydroquinone
U.S. - Minnesota Employee Right-to-Know (5206.0400, Subpart 5. List of Hazardous Substances):	Hydroquinone
U.S. - New Jersey - Worker and Community Right to Know Act (N.J.S.A. 34:5A-1):	Hydroquinone
U.S. - Pennsylvania - Part XIII. Worker and Community Right-to-Know Act (Chapter 323 Hazardous Substance List, Appendix A):	Sodium sulphite , Sodium carbonate, monohydrate , Hydroquinone , Potassium bromide

16. Other information

The data below reflects current legislative requirements whereas the product in your possession may carry a different version of the label depending on the date of manufacture.

US/Canadian Label Statements:

KODAK D-19 Developer

CONTAINS: Sodium sulphite (7757-83-7) , Sodium carbonate, monohydrate (5968-11-6) , Hydroquinone (123-31-9) , Potassium bromide (7758-02-3) , Bis(4-hydroxy-N-methylanilinium) sulphate (55-55-0) , Polyphosphoric acids, sodium salts (68915-31-1).

WARNING! POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURES. MAY LIBERATE SULFUR DIOXIDE. HARMFUL IF INHALED OR SWALLOWED. DUST IRRITATING TO THE EYES AND RESPIRATORY TRACT. CAUSES SKIN AND EYE IRRITATION. REPEATED EXPOSURE TO DUST MAY CAUSE EYE INJURY. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA. MAY CAUSE KIDNEY DAMAGE BASED ON ANIMAL DATA. MAY CAUSE CYANOSIS BASED ON ANIMAL DATA.

Minimize dust generation and accumulation. Do not breathe dust at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Use only with adequate ventilation. Wash thoroughly after handling. **FIRST AID:** If inhaled, remove to fresh air. Get medical attention. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention. In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes. If swallowed, DO NOT induce vomiting. Call a physician or poison control centre immediately. Never give anything by mouth to an unconscious person. **Note to Physicians:** Absorption of this material into the body leads to the formation of methemoglobin that, in sufficient concentration,

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causes cyanosis. Since reversion of methemoglobin to hemoglobin occurs spontaneously after termination of exposure, moderate degrees of cyanosis need to be treated only by supportive measures such as bed rest and oxygen inhalation. Thorough cleansing of the entire contaminated area of the body, including scalp and nails, is of utmost importance. If cyanosis is severe, intravenous injection of methylene blue, one milligram per kilogram of body weight, may be of value. Keep out of reach of children. Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood. Since emptied containers retain product residue, follow label warnings even after container is emptied. **IN CASE OF FIRE:** Water spray, Carbon dioxide (CO₂), Dry chemical. **IN CASE OF SPILL:** Avoid dust formation. Shovel into suitable container for disposal. Clean surface thoroughly to remove residual contamination.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

R-2, S-2, F-1, C-0