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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: KODAK D-19 Developer

Catalog Number(s): 194 6045 - To Make 5 gallons (U.S.)
146 4593 - To Make 1 gallon (U.S.)
EASTMAN KODAK COMPANY, Rochester, New York 14650

For Emergency Health, Safety & Environmental Information,

For other information or to request an MSDS, call (800) 242-2424.

Synonym(s): Concentrate: KAN 354548; PCD 242; C-0026.000
Working solution: KAN 966625; C-0026.100

2. COMPOSITION/INFORMATION ON INGREDIENTS

Weight % - Component - (CAS Registry No.)

Concentrate:

55-60 Sodium sulfite (007757-83-7)
30-35 Sodium carbonate, monohydrate (005968-11-6)
5 Hydroquinone (000123-31-9)
1-5 4-(methylamino)phenol sulfate (000055-55-0)
1-5 Potassium bromide (007758-02-3)
1-5 Sodium hexametaphosphate (010124-56-8)

Working solution:

85-90 Water (007732-18-5)
5-10 Sodium sulfite (007757-83-7)
1-10 Sodium carbonate, monohydrate (005968-11-6)
< 1 Hydroquinone (000123-31-9)
< 1 4-(methylamino)phenol sulfate (000055-55-0)
< 1 Potassium bromide (007758-02-3)

3. HAZARDS IDENTIFICATION

Concentrate:

CONTAINS: Hydroquinone (000123-31-9); 4-(methylamino)phenol sulfate
(000055-55-0); Sodium sulfite (007757-83-7); Sodium carbonate, monohydrate
(005968-11-6); Sodium hexametaphosphate (010124-56-8)

DANGER!

CAUSES EYE IRRITATION OR BURNS
MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA
MAY CAUSE CYANOSIS BASED ON ANIMAL DATA
HARMFUL IF INHALED OR SWALLOWED
REPEATED EXPOSURE TO DUST MAY CAUSE EYE INJURY
DUST IRRITATING TO THE EYES AND RESPIRATORY TRACT
CAUSES SKIN IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION
CONTACT WITH ACID LIBERATES SULFUR DIOXIDE

HMIS Hazard Ratings:

Health - * 2, Flammability - 0, Reactivity - 0, Personal Protection - E

NFPA Hazard Ratings:

Health - 2, Flammability - 0, Reactivity (Stability) - 0

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Working solution:

CONTAINS: Hydroquinone (000123-31-9); Sodium sulfite (007757-83-7);
4-(methylamino)phenol sulfate (000055-55-0)

WARNING!
MAY BE HARMFUL IF SWALLOWED
CAUSES SKIN AND EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION

HMIS Hazard Ratings:
Health - 2, Flammability - 0, Reactivity - 0, Personal Protection - B

NFPA Hazard Ratings:
Health - 1, Flammability - 0, Reactivity (Stability) - 0

NOTE: HMIS and NFPA 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. The personal protection index is only intended for general guidance on personal protection equipment (PPE) that is suitable for the potential hazards of the material. PPE (e.g., respirators) may not be needed if engineering controls (e.g., local ventilation) are adequate. An asterisk (*), in the HMIS health field, designates potential chronic or target organ hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

4. FIRST-AID MEASURES

Inhalation: If symptomatic, move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.

Eyes:

Concentrate: Immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately.
Working solution: Immediately flush with plenty of water for at least 15 minutes. Get medical attention.

Skin:

Concentrate: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If skin irritation or an allergic skin reaction develops, get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.
Working solution: Wash with soap and water. Remove contaminated clothing and shoes. If skin irritation or an allergic skin reaction develops, get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Ingestion:

Concentrate: Do NOT induce vomiting. Give victim a glass of water. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately.
Working solution: Drink 1-2 glasses of water. Seek medical attention. Never give anything by mouth to an unconscious person.

Note to Physicians:

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Concentrate:

Contains: 4-(methylamino)phenol sulfate. 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, 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. Moderate degrees of cyanosis need to be treated only by supportive measures such as bed rest and oxygen inhalation.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Use appropriate agent for adjacent fire.

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

Hazardous Combustion Products: None (noncombustible) (see also Hazardous Decomposition Products section)

Unusual Fire and Explosion Hazards: None

6. ACCIDENTAL RELEASE MEASURES

Concentrate: Flush to sewer with large amounts of water. Otherwise, collect up and put in a suitable container. Clean surface thoroughly to remove residual contamination.

Working solution: Flush to sewer with large amounts of water. Otherwise, absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination.

7. HANDLING AND STORAGE

Personal Precautionary Measures:

Concentrate: Avoid breathing dust. Do not get in eyes and avoid contact with skin and clothing. Use with adequate ventilation. Wash thoroughly after handling. The routine use of a nonalkaline (acid) type of hand cleaner and regular cleaning of working surfaces, gloves, etc. will help minimize the possibility of a skin reaction.

Working solution: Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling. The routine use of a nonalkaline (acid) type of hand cleaner and regular cleaning of working surfaces, gloves, etc. will help minimize the possibility of a skin reaction.

Prevention of Fire and Explosion: No special precautionary measures should be needed under anticipated conditions of use.

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

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:

ACGIH Threshold Limit Value (TLV):

Hydroquinone: 2 mg/m³ TWA
Sulfur dioxide: 2 ppm TWA; 5 ppm STEL

OSHA (USA) Permissible Exposure Limit (PEL - 1971 Table Z-1 Values):

Hydroquinone: 2 mg/m³ TWA
Sulfur dioxide: 5 ppm TWA

Ventilation: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits.

Respiratory Protection:

Concentrate: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. Respirator type: N95 Particulate 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 OSHA Standard 29 CFR 1910.134.

Working solution: None should be needed. 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 OSHA Standard 29 CFR 1910.134.

Eye Protection:

Concentrate: Wear safety glasses with side shields (or goggles) and a face shield. Wear a full-face respirator, if needed.

Working solution: Wear safety glasses with side shields (or goggles).

Skin Protection: Wear impervious gloves and protective clothing appropriate for the risk of exposure.

Recommended Decontamination Facilities: Eye bath, washing facilities, safety shower

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:

Concentrate: Solid
Working solution: Liquid

Color:

Concentrate: White
Working solution: Colorless

Odor: Odorless

Specific Gravity (water = 1):

Concentrate: Not available
Working solution: 1.13

Vapor Pressure at 20°C (68°F):

Concentrate: Negligible

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Working solution: 24 mbar (18 mm Hg)
Vapor Density (Air = 1):
Concentrate: Not applicable
Working solution: 0.6
Volatile Fraction by Weight:
Concentrate: Negligible
Working solution: 90-95%
Boiling Point:
Concentrate: Not applicable
Working solution: >100°C (>212°F)
Melting Point:
Concentrate: Not available
Working solution: Not applicable
Solubility in Water:
Concentrate: Appreciable
Working solution: Complete
pH:
Concentrate: Not applicable
Working solution: 9.9-10.1
Flash Point:
Concentrate: Not applicable, noncombustible solid
Working solution: None, noncombustible liquid

10. STABILITY AND REACTIVITY

Stability: Stable

Incompatibility: Strong acids

Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, sulfur dioxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Effects of Exposure:

General: Contains 4-(methylamino)phenol sulfate. 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 hydroquinone. In F-344 rats, chronic oral administration of hydroquinone has resulted in the formation of benign kidney tumors thought to be secondary to nephropathy. Hydroquinone-induced nephropathy following oral administration has been noted in the male F-344 rat, but not in other species or rat strains tested. Although an increase in mononuclear cell leukemia in F-344 female rats has been reported following chronic oral administration of hydroquinone, this finding was not reproduced in a subsequent study. There was no evidence of carcinogenicity in male mice following chronic oral administration of hydroquinone; some evidence of carcinogenic activity was shown in female mice by an increase in hepatocellular neoplasms which were primarily benign adenomas, although this finding was not reproduced in a subsequent study. No skin tumors were reported in mice following long-term dermal application of hydroquinone. Therefore, neoplastic responses have not been consistent across route of exposure, species, or sex. Hydroquinone is generally negative in bacterial mutagenicity tests; there is evidence for the clastogenicity (chromosome

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breakage) of hydroquinone in vivo and in vitro. The relevance of the chromosomal effects in test animals in predicting human risk is unclear.

Inhalation:

Concentrate: Airborne dust irritating. Harmful if inhaled. May cause irritation to the mucous membranes and upper respiratory tract. In contact with strong acids or if heated, sulfites may liberate sulfur dioxide gas. Sulfur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Working solution: Expected to be a low hazard for usual industrial or commercial handling by trained personnel. In contact with strong acids or if heated, sulfites may liberate sulfur dioxide gas. Sulfur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Eyes:

Concentrate: Causes severe irritation or burns. Airborne dust irritating. However, immediate flushing of the eyes with water will minimize any irritative effect. Repeated exposure to dust may cause eye injury.

Working solution: Causes irritation.

Skin: Causes irritation. May cause allergic skin reaction based on human experience.

Ingestion:

Concentrate: 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.

Working solution: May be harmful if swallowed. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea. May cause irritation of the gastrointestinal tract.

Acute Toxicity Data:

Data for Concentrate:

Oral LD-50 (rat): 0.5-5.0 g/kg

Skin irritation: moderate

12. ECOLOGICAL INFORMATION

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

	Concentrate	Working Solution
Potential Toxicity		
Fish LC50 mg/l:	1-10	10-100
Daphnid EC50 mg/l:	1-10	1-10
Algal IC50 mg/l:	10-100	>100
Organics Readily Degradable (>70%):	Yes (7 days)	Yes (7 days)

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Potential Bioaccumulation:	Log Pow <1	Log Pow <1
COD (approximate g/l):	180	30
BOD5 (approximate g/l):	130	25
Potential Toxicity Waste treatment microorganisms EC50 (mg/l):	>100	>100

13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. Flush to sewer with large amounts of water.

Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION

For transportation information regarding this product call the Kodak Worldwide Transportation Hazmat Hot Line: (585) 722-2400 between 8 a.m. and 5 p.m. (Eastern Standard Time), Monday through Friday.

15. REGULATORY INFORMATION

- Material(s) known to the State of California to cause cancer: None
- Material(s) known to the State of California to cause adverse reproductive effects: None

Carcinogenicity Classification (components present at 0.1% or more):

- International Agency for Research on Cancer (IARC): Sulfur dioxide, some sulfites, bisulfites and metabisulfites, Group 3; Not classifiable.
- American Conference of Governmental Industrial Hygienists (ACGIH): Hydroquinone, A3; Confirmed animal carcinogen with unknown relevance to humans.
- National Toxicology Program (NTP): None
- Occupational Safety and Health Administration (OSHA): None
- Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372: Hydroquinone

16. OTHER INFORMATION

US/Canadian Label Statements:

Concentrate:

CONTAINS: Hydroquinone (000123-31-9); 4-(methylamino)phenol sulfate (000055-55-0); Sodium carbonate, monohydrate (005968-11-6); Sodium sulfite (007757-83-7); Sodium hexametaphosphate (010124-56-8)

DANGER!
CAUSES EYE IRRITATION OR BURNS
MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA

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MAY CAUSE CYANOSIS BASED ON ANIMAL DATA
HARMFUL IF INHALED OR SWALLOWED
REPEATED EXPOSURE TO DUST MAY CAUSE EYE INJURY
DUST IRRITATING TO THE EYES AND RESPIRATORY TRACT
CAUSES SKIN IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION
CONTACT WITH ACID LIBERATES SULFUR DIOXIDE

Avoid breathing dust.
Do not get in eyes and avoid contact with skin and clothing.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: If swallowed, do NOT induce vomiting. Give victim a glass of water. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. If inhaled, move to fresh air. Treat symptomatically. In case of contact, immediately flush eyes and skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Note to Physicians: 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.

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

Additional hazard precautions for containers greater than 1 gallon of liquid or 5 pounds of solid:

Since emptied containers retain product residue, follow label warnings even after container is emptied.

Working solution:

CONTAINS: Hydroquinone (000123-31-9); 4-(methylamino)phenol sulfate (000055-55-0); Sodium sulfite (007757-83-7)

WARNING!
MAY BE HARMFUL IF SWALLOWED
CAUSES SKIN AND EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION

Avoid breathing mist or vapor.
Avoid contact with eyes, skin, and clothing.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: If swallowed, seek medical advice. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In case of skin contact, immediately wash with soap and plenty of water. Get medical attention if symptoms occur. Remove contaminated clothing and

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shoes. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Keep out of reach of children.

For additional information, see Material Safety Data Sheet (MSDS) for this material.

Additional hazard precautions for containers greater than 1 gallon of liquid or 5 pounds of solid:

Since emptied containers retain product residue, follow label warnings even after container is emptied.

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-3, F-0, C-0

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