

000001276/F/USA
Approval Date: 12/10/2001
Print Date: 02/20/2004
Page: 1/9



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: KODAK D-19b Developer

Catalog Number(s): 132 5679 - To Make 2 X 25 litres

Manufacturer/Supplier: EASTMAN KODAK COMPANY, Rochester, New York 14650

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

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

Synonym(s): Concentrate: KAN 966421; PCD 5928; C-0026.200
Working solution: KAN 966422

2. COMPOSITION/INFORMATION ON INGREDIENTS

Weight % - Component - (CAS Registry No.)

Concentrate:

45-50 Sodium sulfite (007757-83-7)
35-40 Sodium carbonate (000497-19-8)
6 Hydroquinone (000123-31-9)
1-5 Potassium bromide (007758-02-3)
1-5 4-(methylamino)phenol sulfate (000055-55-0)

Working solution:

85-90 Water (007732-18-5)
5-10 Sodium sulfite (007757-83-7)
5-10 Sodium carbonate (000497-19-8)
< 1 Hydroquinone (000123-31-9)
< 1 Potassium bromide (007758-02-3)
< 1 4-(methylamino)phenol sulfate (000055-55-0)

3. HAZARDS IDENTIFICATION

Concentrate:

CONTAINS: Hydroquinone (000123-31-9); 4-(methylamino)phenol sulfate (000055-55-0); Sodium sulfite (007757-83-7); Sodium carbonate (000497-19-8)
WARNING!

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

HMIS Hazard Ratings:

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

NFPA Hazard Ratings:

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

Working solution:

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

MATERIAL SAFETY DATA SHEET

000001276/F/USA

Approval Date: 12/10/2001

Print Date: 02/20/2004

Page: 2/9

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

HMIS Hazard Ratings:
Health - 1, Flammability - 0, Reactivity - 0, Personal Protection - C

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:

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

Working solution: 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.

Working solution: Immediately flush with plenty of water for at least 15 minutes. Get medical attention if symptoms occur.

Skin: 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.

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:

Concentrate: 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,

MATERIAL SAFETY DATA SHEET

000001276/F/USA

Approval Date: 12/10/2001

Print Date: 02/20/2004

Page: 3/9

intravenous injection of methylene blue, one milligram per kilogram of body weight, may be of value.

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, sweep up and place in a container for chemical waste. 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. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling.

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

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).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:

ACGIH Threshold Limit Value (TLV):

Sulfur dioxide: 2 ppm TWA; 5 ppm STEL

Hydroquinone: 2 mg/m³ TWA

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

Sulfur dioxide: 5 ppm TWA; 13 mg/m³ TWA

Hydroquinone: 2 mg/m³ TWA

Ventilation:

MATERIAL SAFETY DATA SHEET

000001276/F/USA

Approval Date: 12/10/2001

Print Date: 02/20/2004

Page: 4/9

Concentrate: 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.

Working solution: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions.

Respiratory Protection:

Concentrate: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn.

Respirator type: Dust. A full-face positive-pressure air-supplied respirator must be worn if hazardous decomposition products are likely to be released or have been released. 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: It is a good industrial hygiene practice to minimize eye contact. 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: 1.10-1.12

Vapor Pressure at 20°C (68°F):

Concentrate: Negligible

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: 85-90%

Boiling Point:

Concentrate: Not applicable

MATERIAL SAFETY DATA SHEET

000001276/F/USA

Approval Date: 12/10/2001

Print Date: 02/20/2004

Page: 5/9

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: 10
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 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: Harmful if inhaled. Airborne dust irritating. Some asthmatics

MATERIAL SAFETY DATA SHEET

000001276/F/USA

Approval Date: 12/10/2001

Print Date: 02/20/2004

Page: 6/9

or hypersensitive individuals may experience difficult breathing. 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.

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

Working solution: Causes irritation.

Skin:

Concentrate: Causes irritation. May cause skin depigmentation. Prolonged or repeated contact with aqueous solutions may cause irritation. May cause allergic skin reaction based on human experience.

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

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	1-10
Algal IC50 mg/l:	10-100	>100
Organics Readily Degradable (>70%):	Yes (7 days)	Yes (7 days)
Potential Bioaccumulation:	Log Pow <1	Log Pow <1
COD (approximate g/l):	29	32
BOD5 (approximate g/l):	20	22
Potential Toxicity		

MATERIAL SAFETY DATA SHEET

000001276/F/USA
Approval Date: 12/10/2001
Print Date: 02/20/2004
Page: 7/9

Waste treatment >100 >100
microorganisms EC50
(mg/l):

13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. Consult state or local regulatory authorities before flushing 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.
 - Hydroquinone, Group 3; Not classifiable.
 - American Conference of Governmental Industrial Hygienists (ACGIH): hydroquinone (A3) - animal carcinogen
 - 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 sulfite (007757-83-7); Sodium carbonate (000497-19-8)

WARNING!

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

Avoid breathing dust.
Avoid contact with eyes, skin, and clothing.
Keep container closed.

MATERIAL SAFETY DATA SHEET

000001276/F/USA

Approval Date: 12/10/2001

Print Date: 02/20/2004

Page: 8/9

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. 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.

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.

IN CASE OF SPILL: Sweep or scoop up and remove.

Working solution:

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

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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. Never give anything by mouth to an unconscious person. 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 if symptoms occur. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

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MATERIAL SAFETY DATA SHEET

000001276/F/USA

Approval Date: 12/10/2001

Print Date: 02/20/2004

Page: 9/9

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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-2, F-0, C-0

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