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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: KODAK DK-50 Developer

Catalog Number(s): 122 8865 - To Make 128 ounce(s)
146 4924 - To Make 1 gallon (U.S.)
146 4932 - To Make 3 1/2 gallons (U.S.)
153 7927 - To Make 10 gallons (U.S.)

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): Part A: KAN 354523; PCD 107; C-0033.000
Part B: KAN 354561; PCD 314; C-0034.000
Working solution: KAN 965820

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Weight % - Component - (CAS Registry No.)

Part A:

50	Hydroquinone (000123-31-9)
45-50	4-(methylamino)phenol sulfate (000055-55-0)

Part B:

75-80	Sodium sulfite (007757-83-7)
15-20	Sodium metaborate (007775-19-1)
1-5	Potassium bromide (007758-02-3)

Working solution:

95-100	Water (007732-18-5)
1-5	Sodium sulfite (007757-83-7)
< 1	Sodium metaborate (007775-19-1)
< 1	Hydroquinone (000123-31-9)
< 1	4-(methylamino)phenol sulfate (000055-55-0)

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3. HAZARDS IDENTIFICATION

Part A:

CONTAINS: Hydroquinone (000123-31-9), 4-(methylamino)phenol sulfate (000055-55-0)

WARNING!
MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA
MAY CAUSE CYANOSIS BASED ON ANIMAL DATA
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
POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURES

HMIS Hazard Ratings:

Health - 2 *, Flammability - 1, Reactivity - 0, Personal Protection - E

NFPA Hazard Ratings:
Health - 2, Flammability - 1, Reactivity (Stability) - 0

Part B:

CONTAINS: Sodium sulfite (007757-83-7); Sodium metaborate (007775-19-1)

WARNING!
MAY BE HARMFUL IF INHALED, ABSORBED THROUGH SKIN, OR SWALLOWED
CAUSES SKIN AND EYE IRRITATION
MAY LIBERATE SULFUR DIOXIDE

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

NFPA Hazard Ratings:
Health - 2, Flammability - 0, Reactivity (Stability) - 0

Working solution:

CONTAINS: Sodium sulfite (007757-83-7), 4-(methylamino)phenol sulfate (000055-55-0)

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

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

NFPA Hazard Ratings:
Health - 2, 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.

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4. FIRST-AID MEASURES

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

Eyes:

Part A: Immediately flush with plenty of water for at least 15 minutes. Get medical attention.

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

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. Get medical attention if symptoms occur. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Ingestion:

Part A: Induce vomiting as directed by medical personnel. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

Part B: Only induce vomiting at the instruction of medical personnel. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

Working solution: Drink 1-2 glasses of water. Seek medical attention. 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, 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:

Part A: Water spray, carbon dioxide (CO_2), dry chemical

Part B & Working solution: Use appropriate agent for adjacent fire.

Special Fire-Fighting Procedures:

Part A & Part B: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products.

Working solution: Wear self-contained breathing apparatus and protective clothing.

Hazardous Combustion Products:

Part A: Carbon dioxide, carbon monoxide, oxides of sulfur, oxides of nitrogen

Part B: None (noncombustible) (see also Hazardous Decomposition Products section)

Working solution: None (noncombustible)

Unusual Fire and Explosion Hazards:

Part A: Powdered material may form explosive dust-air mixtures.

Part B & Working solution: None

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6. ACCIDENTAL RELEASE MEASURES

Avoid generation of dust. Flush to sewer with large amounts of water. Clean surface thoroughly to remove residual contamination.

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7. HANDLING AND STORAGE

Personal Precautionary Measures:

Part A: Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling.

Part B: 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:

Part A: Powdered material may form explosive dust-air mixtures. Minimize dust generation and accumulation. Use with adequate ventilation. Keep away from sources of ignition. Refer to NFPA Pamphlet No. 654, "Prevention of Fire and Dust Explosions in the Chemical, Dye, Pharmaceutical, and Plastics Industries." Keep from contact with oxidizing materials.

Part B & Working solution: No special precautionary measures should be needed under anticipated conditions of use.

Storage:

Part A & Working solution: Keep container closed.

Part B: Keep container tightly 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, 13 mg/m3 TWA

Ventilation:
Part A & Part B: 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:

Part A: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. Respirator type: Full-face with organic vapor & P95 particulate filter. If respirators are used, a program should be instituted to assure compliance with OSHA Standard 29 CFR 1910.134.

Part B: 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:

Part A & Part B: Wear safety glasses with side shields (or goggles) and a face shield.

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, safety shower, washing facilities

9. PHYSICAL AND CHEMICAL PROPERTIES

	Part A	Part B	Working solution
Physical Form:	solid	solid	liquid
Color:	light tan	light yellow	colorless
Odor:	odorless	odorless	odorless
Specific Gravity (water = 1):	1.00	>1.00	1.03
Vapor Pressure at 20°C (68°F):	negligible	negligible	24 mbar (18 mm Hg)

Vapor Density (Air = 1):	not applicable	not applicable	0.6
Volatile Fraction by Weight:	negligible	negligible	95-100%
Boiling Point:	not applicable	not applicable	>100°C (>212°F)
Melting Point:	not available	not available	not applicable
Solubility in Water:	complete	complete	complete
pH:	not applicable	not applicable	9.5
Flash Point:	not applicable, combustible solid	not applicable, noncombustible solid	none, noncombustible liquid

10. STABILITY AND REACTIVITY

Stability: Stable

Incompatibility:

Part A: Strong oxidizing agents

Part B: Strong acids

Working solution: None with common materials and contaminants with which the material may reasonably come into contact.

Hazardous Decomposition Products:

Part B: Sulfur dioxide

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Effects of Exposure:

General:

Part A:

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: 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.

Part B:

Contains: Sodium metaborate. Based on repeated-dose ingestion studies in animals, may cause adverse reproductive and developmental effects. However, the doses administered were many times those to which humans would normally be exposed.

Inhalation:

Part A: Harmful if inhaled. Airborne dust irritating.

Part B: May be harmful if inhaled. Airborne dust irritating. 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 recommended handling. 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:

Part A: Causes irritation. Airborne dust irritating. Repeated exposure to dust may cause eye injury.

Part B: Causes irritation.

Working solution: Causes irritation.

Skin:

Part A & Working solution: Causes irritation. May cause allergic skin reaction based on human experience.

Part B: Causes irritation. May be absorbed in toxic amounts through damaged or abraded skin. This material has a low potential to cause allergic skin reactions; however, cases of human skin sensitization have been reported.

Ingestion:

Part A: Harmful if swallowed.

Part B & 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 if swallowed.

12. ECOLOGICAL INFORMATION

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

	Part A	Part B	Working Solution
Potential Toxicity			
Fish LC50 mg/l:	<1	>100	10-100
Daphnid EC50 mg/l:	<1	10-100	10-100
Algal IC50 mg/l:	1-10	Not available	>100
Organics Readily Degradable (>70%):	Yes (7 days)	Not applicable	Yes (7 days)
Potential Bioaccumulation:	Log Pow <1	Log Pow <1	Log Pow <1
COD (approximate g/l):	1580	104	12
BOD5 (approximate g/l):	925	104	8
Potential Toxicity Waste treatment microorganisms EC50 (mg/l):	10-100	>100	>100

13. DISPOSAL CONSIDERATIONS

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

Part A:

For Small Amounts: Flush to sewer with large amounts of water.

For Large Amounts: Incinerate.

Part B & Working solution: Flush to sewer with large amounts of water.

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): Hydroquinone, Group 3, not classifiable as to carcinogenicity to humans; sulphur dioxide, some sulphites,

bisulphites and metasulphites, Group 3, not classifiable as to carcinogenicity to humans
- 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:

Part A:

CONTAINS: Hydroquinone (000123-31-9), 4-(methylamino)phenol sulfate (000055-55-0)

WARNING!
MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA
MAY CAUSE CYANOSIS BASED ON ANIMAL DATA
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
POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURES

Avoid breathing dust.
Avoid contact with eyes, skin, and clothing.
Minimize dust generation and accumulation.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: If swallowed, induce vomiting immediately as directed by medical personnel. 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 FIRE: Use water spray, carbon dioxide (CO2), dry chemical

IN CASE OF SPILL: Sweep or scoop up and remove. Flush spill area with water spray.

Part B:

CONTAINS: Sodium sulfite (007757-83-7); Sodium metaborate (007775-19-1)

WARNING!
MAY BE HARMFUL IF INHALED, ABSORBED THROUGH SKIN, OR SWALLOWED
CAUSES SKIN AND EYE IRRITATION
MAY LIBERATE SULFUR DIOXIDE

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

FIRST AID: If swallowed, only induce vomiting as directed by medical personnel. 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 if symptoms occur. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

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IN CASE OF SPILL: Sweep or scoop up and remove. Flush spill area with water spray.

Working solution:

CONTAINS: Sodium sulfite (007757-83-7), 4-(methylamino)phenol sulfate (000055-55-0)

WARNING!
CAUSES SKIN AND EYE IRRITATION
MAY BE HARMFUL IF SWALLOWED
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.

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.

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