Material Safety Data Sheet

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

Product name: KODAK HC-110 Developer

Product code: 1408988

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 4987

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

2. Hazards identification

CONTAINS: Diethanolamine (111-42-2), Sulphur dioxide (7446-09-5), Hydroquinone (123-31-9), Diethylene glycol (111-46-6), Ethanolamine (141-43-5), Diethylenetriaminepentaacetic acid (67-43-6), Potassium bromide (7758-02-3), 1,2-Benzenediol (120-80-9)

DANGER!
HARMFUL IF INHALED, ABSORBED THROUGH SKIN, OR SWALLOWED
MIST OR VAPOR IRRITATING TO EYES AND RESPIRATORY TRACT
CAUSES SKIN AND EYE BURNS
MAY CAUSE ALLERGIC SKIN REACTION
CAN CAUSE KIDNEY DAMAGE AND CNS EFFECTS FOLLOWING INGESTION
MAY CAUSE LIVER DAMAGE BASED ON ANIMAL DATA
MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA

HMIS III Hazard Ratings: Health - 3*, Flammability - 1, Reactivity (Stability) - 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.

3. Composition/information on ingredients

Weight %	Components - (CAS-No.)
30 - 35	Diethanolamine (111-42-2)
15 - 20	Sulphur dioxide (7446-09-5)
5 - 10	Hydroquinone (123-31-9)
5 - 10	Diethylene glycol (111-46-6)
5 - 10	Ethanolamine (141-43-5)

1 - 5	Diethylenetriaminepentaacetic acid (67-43-6)
1 - < 5	Potassium bromide (7758-02-3)
0.1 - < 1	1,2-Benzenediol (120-80-9)
0.1 - < 1	Ethylene glycol (107-21-1)

4. First aid measures

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

Eyes: Immediately flush the contaminated eye(s) with water for at least 60 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Neutral saline solution may be used as soon as it is available. DO NOT INTERRUPT FLUSHING. Contact a physician or poison control center immediately. Continue flushing the eye(s) until the physician advises to stop. If necessary, continue flushing during transport to an emergency care facility.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control centre immediately. 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.

5. Fire-fighting measures

Extinguishing Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

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

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

Unusual Fire and Explosion Hazards: None.

6. Accidental release measures

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 precautions: Do not breathe mist or vapour at concentrations greater than the exposure limits. Do not get in eyes, on skin, or on 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: 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
Diethanolamine	ACGIH	time weighted average	1 mg/m3
		Form of exposure: inhalable fraction and vapor	
		Skin - potential significant contribution to overall exposure by the cutaneous route	
Sulphur dioxide		Short term exposure limit	0.25 ppm
	OSHA	time weighted average	5 ppm 13 mg/m3
Hydroquinone	ACGIH	time weighted average	1 mg/m3
	OSHA	time weighted average	2 mg/m3
Ethanolamine	ACGIH	time weighted average	3 ppm
		Short term exposure limit	6 ppm
	OSHA	time weighted average	3 ppm 6 mg/m3
1,2-Benzenediol	ACGIH	time weighted average	5 ppm
		Skin - potential significant contribution to overall exposure by the cutaneous route	
		prevent or reduce skin absorption	

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: organic vapour/P95. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

Eye protection: Wear safety glasses with side shields (or goggles) and a face shield.

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

9. Physical and chemical properties

Physical form: liquid

Colour: yellow

Odour: amine

Specific gravity: 1.24

Vapour pressure: 18 mbar (13.5 mm Hg)

Vapour density: 0.6

Volatile fraction by weight: 65 - 70 %

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

Water solubility: complete

pH: 9.0

Flash point: 93.33 °C (200.0 °F) (estimated)

10. Stability and reactivity

Stability: Stable under normal conditions.

Incompatibility: Strong oxidizing agents.

Hazardous decomposition products: nitrogen oxides (NOx), Sulphur oxides

Hazardous Polymerization: Hazardous polymerisation does not occur.

11. Toxicological information

Effects of Exposure

General advice:

Contains: Diethanolamine. Based on animal data, may cause adverse effects on the following organs/systems: kidney, liver, blood, nervous system, testes.

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: Diethylene glycol. Can cause kidney damage and CNS effects following ingestion. Repeated oral exposure to high doses can cause liver damage.

Contains: Ethylene glycol. Harmful or fatal if swallowed. Can cause kidney damage and CNS effects based on human data. May cause adverse reproductive effects following ingestion based on animal data.

Inhalation: Harmful if inhaled. Mist or vapour irritating.

Eyes: Causes eye burns. Mist or vapour irritating.

Skin: Harmful if absorbed through skin. Causes skin burns. 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 irritation of the gastrointestinal tract. Can cause kidney damage and CNS effects following ingestion.

Data for Diethanolamine (CAS 111-42-2):

Acute Toxicity Data:
Oral LD50 (rat): 1,410 mg/kg

- Dermal LD50 (rabbit): 11.89 ml/kg
- Skin irritation: strong
- Eye irritation: Corrosive

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:

- Inhalation (30-day, guinea pig): NOAEL; 0.6 ppm
- Feeding study (30-day, male rat): LOEL (Lowest observable effect level); 0.1 % in diet

Data for Sulphur dioxide (CAS 7446-09-5):

Acute Toxicity Data:

- Inhalation LC50 (rat): 2500 ppm / 1 hr

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

Acute Toxicity Data:
Oral LD50 (rat): 400 mg/kg

- Dermal LD50 (guinea pig): > 1,000 mg/kg
- Dermal absorption rate: 1.1 micrograms (s) / cm 2 / 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): LOEL (Lowest observable effect level); 4800 mg/kg/day

Developmental Toxicity Data:
Oral (female rabbit): NOEL for developmental toxicity; 25mg/kg/day

Data for Diethylene glycol (CAS 111-46-6):

Acute Toxicity Data:
Oral LD50 (rat): > 3,200 mg/kg

- Dermal LD50 (rabbit): > 10,000 mg/kg
- Skin irritation: slight to moderate
- Eye irritation: mild

Mutagenicity/Genotoxicity Data:
Ames test: negative (in presence and absence of activation)

Data for Ethanolamine (CAS 141-43-5):

Acute Toxicity Data:
Oral LD50 (rat): 400 - 800 mg/kg

- Oral LD50 (mouse): 1,600 mg/kg
- Dermal LD50 (guinea pig): 0.1 - 1.0 cc/kg
- Dermal LD50 (rabbit): 1 mL/kg
- Skin irritation: severe
- Skin Sensitization (guinea pig): positive (The results of a test on guinea pigs showed this substance to be a weak skin sensitizer.)
- Eye irritation: Corrosive

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:

- Feeding study (, male rat): NOEL; 1 % in diet
- Feeding study (, male rat): NOEL; 770 mg/kg/day
- Inhalation (, male rat): LOEL (Lowest observable effect level);

Data for Diethylenetriaminepentaacetic acid (CAS 67-43-6):

Acute Toxicity Data:
Oral LD50 (male rat): 3,200 mg/kg

- Oral LD50 (female rat): 2,539 mg/kg
- Dermal LD50 (guinea pig): > 1 g/kg
- Skin irritation: slight
- Skin irritation: severe (repeated skin application)
- Skin Sensitization (guinea pig): negative
- Eye irritation (washed eyes): slight
- Eye irritation (unwashed eyes): moderate

Data for 1,2-Benzenediol (CAS 120-80-9):

Acute Toxicity Data:
Oral LD50 (mouse): 100 - 200 mg/kg

- Oral LD50 (rat): 260 mg/kg
- Dermal LD50 (rabbit): 800 mg/kg
- Skin irritation: strong
- Skin Sensitization (guinea pig): positive
- Eye irritation: strong

12. Ecological information

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

Potential Toxicity:

Toxicity to fish (LC50):	10 - 100 mg/l
Toxicity to daphnia (LC50):	> 100 mg/l
Persistence and degradability:	Readily biodegradable.
Chemical Oxygen Demand (COD):	ca. 1347 g/l
Biochemical Oxygen Demand (BOD):	ca. 916 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	All listed
DSL	All listed
NDSL	None listed
EINECS	Not all listed
ELINCS	None listed

NLP	None listed
AICS	All listed
IECS	All listed
ENCS	All listed
ECI	All listed
NZIoC	All listed
PICCS	All listed
TSCA 12(b)	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: Diethanolamine, 1,2-Benzenediol, Hydroquinone
International Agency for Research on Cancer (IARC):	Group 2B - Possibly Carcinogenic to Humans: 1,2-Benzenediol
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):	OSHA Carcinogen or Potential Carcinogen: 1,2-Benzenediol
California Prop. 65	WARNING! This product contains a chemical known in the State of California to cause cancer.
U.S. - CERCLA/SARA (40 CFR § 302.4 Designation of hazardous substances):	Diethanolamine, 1,2-Benzenediol, 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, Sulphur dioxide
U.S. - CERCLA/SARA - Section 313 (40 CFR § 372.65 Toxic Chemical Release Reporting):	Diethanolamine, 1,2-Benzenediol, Hydroquinone
U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances:	Diethanolamine, Hydroquinone, Ethanolamine, Sulphur dioxide
U.S. - California - 8 CCR Section 5200-5220 - Specifically Regulated Carcinogens:	No components found on the California 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):	Diethanolamine, Hydroquinone, Ethanolamine, Sulphur dioxide
U.S. - Minnesota Employee Right-to-Know (5206.0400, Subpart 5. List of Hazardous Substances):	Diethanolamine, Diethylene glycol, Hydroquinone, Ethanolamine, Sulphur dioxide
U.S. - New Jersey - Worker and Community Right to Know Act (N.J.S.A. 34:5A-1):	Diethanolamine, Hydroquinone, Ethanolamine, Sulphur dioxide
U.S. - Pennsylvania - Part XIII. Worker and Community Right-to-Know Act (Chapters 301-323):	Ethylene glycol, Diethanolamine, Diethylene glycol, 1,2-Benzenediol, Hydroquinone, Ethanolamine, Sulphur dioxide, Water
U.S. - Rhode Island - Title 28 Labor and Labor Relations (Chapters 28-21 Hazardous Substance Right-to-Know Act):	Diethanolamine, Diethylene glycol, Hydroquinone, Ethanolamine, Sulphur dioxide

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 HC-110 Developer
CONTAINS: Diethanolamine (111-42-2), Sulphur dioxide (7446-09-5), Hydroquinone (123-31-9), Diethylene glycol (111-46-6), Ethanolamine (141-43-5), Diethylenetriaminepentaacetic acid (67-43-6), Potassium bromide (7758-02-3), 1,2-Benzenediol (120-80-9).
DANGER! HARMFUL IF INHALED, ABSORBED THROUGH SKIN, OR SWALLOWED. MIST OR VAPOR IRRITATING TO EYES AND RESPIRATORY TRACT. CAUSES SKIN AND EYE BURNS. MAY CAUSE ALLERGIC SKIN REACTION. CAN CAUSE KIDNEY DAMAGE AND CNS EFFECTS FOLLOWING INGESTION. MAY CAUSE LIVER DAMAGE BASED ON ANIMAL DATA. MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA.
Do not breathe vapours or spray mist. 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. Immediately flush the contaminated eye(s) with water for at least 60 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Neutral saline solution may be used as soon as it is available. DO NOT INTERRUPT FLUSHING. Contact a physician or poison control center immediately. Continue flushing the eye(s) until the physician advises to stop. If necessary, continue flushing during transport to an emergency care facility. In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control centre immediately. 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. 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:** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. **IN CASE OF SPILL:** Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Additional Components Include: Water (7732-18-5), Ethylene glycol (107-21-1).

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-1, C-0