

Microfiche No.			075 050 9762		
New Doc I.D.		89-8680015		Old Doc I.D.	
				8EHR-0186-0575	
Date Produced		Date Received		TSCA section	
08/19/85		01/24/86		8E	
Submitting Organization			Eastman Kodak Co		
Contractor			Eastman Kodak HEALTH & ENV Labs		
Document Title			Acute Toxicity of 2-((4-amino-3-methylphenyl) ethyl amino) ethanol sulfate with cover letter and attached Material Safety Data Sheet		
Chemical Category			2-((4-amino-3-methylphenyl) ethyl amino) ethanol sulfate		



54 pp. (22)

8EHQ-0186-0575
89-8680015
FLWP

January 20, 1986

Document Control Officer (WH-557)
Information Management Division
Office of Toxic Substances
U.S. Environmental Protection Agency
401 M Street, S. W.
Washington, D.C. 20460

EPA-OTS



000400858P

Dear Sir or Madam:

This is in response to Mr. Frank D. Kover's letter of December 23, 1985 to Dr. R. L. Raleigh requesting further information subsequent to our submission on 2-((4-Amino-3-methylphenyl)-ethylamino)ethanol sulfate (EPA Document Control Number 8EHQ-1185-0575).

Specific information requested by EPA is given below:

1. Provide a full copy of the final report.

The submission was based on an oral LD50 study. A copy of the final report, including the protocol, gross and histopathological examination, and statistical analyses, is enclosed with this letter.

2. Describe actions taken to warn workers and others.

We have updated our Material Safety Data Sheet (MSDS) and label to reflect our findings. A copy of the MSDS with the new label is enclosed for your information. As indicated in the initial submission, our current handling precautions have been reviewed and are believed adequate.

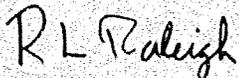
Document Control Officer--2
January 20, 1986

3. Describe past, current, and future studies pertaining to toxicity and exposure.

Studies conducted on this compound in the past are summarized on the MSDS. Our submission of December 9, 1985 contains the results of a glove permeation study indicating that the gloves tested (natural rubber, neoprene, and nitrile gloves) are effective barriers against the compound. We are conducting a repeat of the oral LD50 study. We are currently evaluating the need for future studies. The Agency will be provided with the final report for the repeat LD50 study when available.

Please contact me if additional information is required.

Sincerely,



Robert L. Raleigh, M.D., Director
Health and Environment Laboratories

RLR:WLH
Enc.

cc: R. H. Bell
L. H. Clem
W. L. Hart
E. Stern

00003

MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650

For Emergency Health, Safety, and Environmental Information, call (716) 722-5151
For all other purposes, call the Marketing and Distribution Center in your area.

Revised Date of Preparation: 12/31/85 Kodak Accession Number: 904984

SECTION I. IDENTIFICATION

- ^ Product Name: KODAK Color Developing Agent, CD-4
- ^ Synonym(s): 2-((4-Amino-3-methylphenyl)ethylamino)ethanol sulfate;
4-(N-Ethyl-N-2-hydroxyethyl)-2-methylphenylenediamine sulfate
- ^ Formula: $C_{11}H_{18}N_2O \cdot H_2SO_4$
- ^ Kodak Photographic Chemicals Catalog Number(s): CAT 197 8337 - 50 Pounds;
CAT 160 0279 - 200 Pounds
- ^ Component Number: 12417, 12413
- ^ Kodak's Internal Hazard Rating Codes: R: 2 S: 3 F: 1 C: 1

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT(S):	Weight Percent	TLV*	Kodak Accession No.	CAS Reg. No.
4-(N-Ethyl-N-2-hydroxyethyl)-2-methylphenylenediamine sulfate	~ 100	---	904984	25646-77-9

B. PRECAUTIONARY LABEL STATEMENT(S):

CONTAINS: 4-(N-Ethyl-N-2-hydroxyethyl)-2-methylphenylenediamine sulfate
 DANGER!
 POISON
 CAN BE FATAL IF SWALLOWED
 HARMFUL IF INHALED
 MAY CAUSE KIDNEY INJURY
 CAUSES SKIN AND EYE IRRITATION
 CAN CAUSE ALLERGIC SKIN REACTION
 THIS MATERIAL, LIKE MOST ORGANIC MATERIALS IN POWDER FORM, IS CAPABLE OF
 CREATING A DUST EXPLOSION. REFER TO NFPA PAMPHLET NO. 654
 Avoid breathing dust.
 Avoid contact with eyes, skin, and clothing.
 Use with adequate ventilation.
 Wash thoroughly after handling.
 First Aid: In case of eye contact, immediately flush with plenty of water
 for at least 15 minutes. In case of skin contact, immediately wash with soap
 and plenty of water. If inhaled, remove to fresh air. If swallowed, if
 conscious, immediately rinse mouth and induce vomiting by giving 2 glasses of
 water and touching back of throat with finger or blunt object. Call a
 physician immediately.

SECTION III. PHYSICAL DATA

- ^ Appearance and Odor: Pink to lavender crystals; slight sweet odor
- ^ Melting with Decomposition: 157 °C (315 °F)
- ^ Boiling Point: Decomposes
- ^ Vapor Pressure: Negligible
- ^ Evaporation Rate (n-butyl acetate = 1): Negligible
- ^ Vapor Density (Air = 1): Not Applicable
- ^ Volatile Fraction by Weight: Negligible
- ^ Specific Gravity (H₂O = 1): Not Available
- ^ Solubility in Water (by Weight): Appreciable

00001

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- ^ Combustible dust
- ^ Extinguishing Media: Water spray; Dry chemical; CO₂
- ^ Special Fire Fighting Procedures:
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
- ^ Unusual Fire and Explosion Hazards:
Fire or excessive heat may cause production of hazardous decomposition products.
This material, like most organic materials in powder form, is capable of creating a dust explosion.

SECTION V. REACTIVITY DATA

- ^ Stability: Stable
- ^ Incompatibility: Strong oxidizers
- ^ Hazardous Decomposition Products:
As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
Oxides of nitrogen and sulfur may also be present.
- ^ Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

- A. THRESHOLD LIMIT VALUE: Not established
- B. EXPOSURE EFFECTS:

General: Systemic exposure may cause kidney injury.

Inhalation: Harmful if inhaled.
Dust may cause upper respiratory tract irritation.

Eyes: Contact with the powder can cause eye irritation.

Skin: Causes skin irritation. Can cause an allergic skin reaction.

Ingestion: Harmful or fatal if swallowed.

- C. FIRST AID:

Inhalation: Remove from exposure, treat symptomatically, and get medical attention if symptoms persist.

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes and get medical attention.

Skin: Flush skin with plenty of water and wash with a non-alkaline (acid) type of skin cleanser.
If skin irritation or an allergic skin reaction develops, get medical attention.
Remove contaminated clothing.

Ingestion: If swallowed, if conscious, rinse mouth and induce vomiting immediately by giving 1 or 2 glasses of water and touching back of throat with finger or blunt object and/or induce vomiting with syrup of ipecac. Never give anything by mouth to an unconscious person.

CALL A PHYSICIAN AT ONCE.

D. TOXICITY DATA:

<u>Test</u>	<u>Species</u>	<u>Result (1)</u>	<u>Classification (2)</u>
Acute Oral LD50	Rat (male)	81 mg/kg	Moderately toxic
Acute Oral LD50	Rat (female)	35 mg/kg	Highly toxic
Acute Oral LD50	Mouse	100-200 mg/kg	
Skin Absorption	Guinea Pig	No evidence of absorption at 1.0 g/kg based on lack of mortality, body weight changes, and clinical signs.	
Skin Irritation	Guinea Pig	Moderate Irritation	
Skin Sensitization	Guinea Pig	None sensitized	
Intraperitoneal LD50	Rat, Mouse	10-25 mg/kg	

Other: Skin sensitization has been reported in humans handling this chemical.

SECTION VII. VENTILATION AND PERSONAL PROTECTION

A. VENTILATION:

Good general ventilation* should be used. Local exhaust ventilation or an enclosed handling system may be needed to control air contamination.

*Typically 10 room volumes per hour is considered good general ventilation: Ventilation rates should be matched to conditions of use.

B. RESPIRATORY PROTECTION:

A NIOSH-approved dust respirator should be worn if needed. If respirators are used, a program should be instituted to assure compliance with OSHA standard 29CFR 1910.134.

C. SKIN AND EYE PROTECTION:

Natural rubber, neoprene or nitrile gloves should be worn. Safety glasses should be worn. The routine use of a non-alkaline (acid) type of hand cleanser will help minimize the possibility of allergic skin reaction.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Keep from contact with oxidizing materials.

SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Small Amount - flush material to sewer with large amounts of water.
Large Amounts - make up into small packages with paper or other flammable material for incineration.
Dispose in incinerator equipped with afterburner and scrubber or contract with licensed chemical waste disposal agency.
Discharge, treatment, or disposal may be subject to federal, state, or local laws.

SECTION X. ENVIRONMENTAL EFFECTS DATA

A. SUMMARY:

This chemical has a low biological oxygen demand, and it is expected to cause little oxygen depletion in aquatic systems. It has a high potential to affect aquatic organisms and secondary waste treatment microorganisms. It has a moderate potential to affect the germination of some plants. It has a

is not expected to cause an adverse environmental effect. However, after dilution with a large amount of water, followed by secondary waste treatment, this chemical is not expected to have any adverse environmental impact.^{1,3,4}

B. OXYGEN DEMAND DATA:

COD: 1.48 g/g⁽³⁾
BOD₅: 0.15 g/g

C. ACUTE AQUATIC EFFECTS:

96-hour LC₅₀; Fathead minnow: 0.5 - 1.0 mg/L⁽³⁾
96-hour LC₅₀; Water flea: 0.75 mg/L

D. SECONDARY WASTE TREATMENT COMPATIBILITY:

5-hour IC₅₀: 200 mg/L⁽¹⁾

E. PLANT GERMINATION EFFECTS:

No Adverse Effects at:
Ryegrass 10 mg/L⁽¹⁾
Radish 10 mg/L
Lettuce 10 mg/L

F. PLANT SEEDLING EFFECTS

No Adverse Effects at:
Marigold 100 mg/L⁽¹⁾
Radish 100 mg/L
Corn 100 mg/L
Lettuce 100 mg/L

=====
SECTION XI. TRANSPORTATION

For transportation information regarding this product, please phone the Eastman Kodak Distribution Center nearest you: Rochester, NY (716) 254-1300; Oak Brook, IL (312) 654-5300; Chamblee, GA (404) 455-0123; Dallas, TX (214) 241-1611; Whittier, CA (213) 945-1255; Honolulu, HI (808) 833-1661.
=====

SECTION XII. REFERENCES

1. Unpublished Data. Health, Safety, and Human Factors Laboratory. Eastman Kodak Company, Rochester, New York.
 2. Hodge, H.C., and Sterner, J.H., Am. Indust. Hyg. Assn. Quart. 10:93, 1949.
 3. National Association of Photographic Manufacturers, Inc. and Hydroscience, Inc., Environmental Effects of Photoprocessing Chemicals, National Association of Photographic Manufacturers, Harrison, New York, 1974, 2 vols.
 4. Kodak Publication J-41, BOD₅ and COD of Photographic Chemicals, Eastman Kodak Co., 1981.
- =====

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 the 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.
=====

PATHOLOGY REPORT

Compound: 2-((4-Amino-3-methylphenyl)ethylamino)ethanol sulfate
(1:1)(salt); CD4

Male rats given 25, 50, 100 or 200 mg/kg of the test compound and female rats given 25, 50, 100, 200 or 400 mg/kg of the test compound to determine approximate LD₅₀ values were necropsied. Necropsy findings and lesions observed during histopathologic examination of selected tissues are listed in the attached tables (Tables 1-4).

The majority of lesions listed on these tables were considered compound or exposure-related. Necropsy lesions which were not compound or exposure-related included multiple red or grey foci in the lungs, a dysplastic rt. kidney in Rat 436, a hypoplastic rt. ureter in Rat 436, a displaced rt. adrenal gland in Rat 436, and hydrometra in Rat 220. Histopathology lesions which were not compound or exposure-related included perivascular mononuclear cell cuffing, interstitial inflammation, centriacinitis and chronic bronchitis in the lungs, focal chronic inflammation in the liver, dysplasia of the rt. kidney in Rat 436, and hypoplasia of the rt. ureter in Rat 436.

The remaining lesions were considered due to exposure to the test compound either directly or indirectly. The kidneys, lungs, thymus, liver, heart, spleen, stomach, duodenum, and testes were altered by this exposure. The effects observed were related both to dose and to the length of the survival period following dosing.

The most consistently and severely affected organ was the kidney. All animals examined showed lesions of renal toxicity and at least some of the lesions observed in other organs are probably secondary to renal toxicity or renal failure. At necropsy, the most common change was pallor or yellow discoloration of the entire cortex. Renal medullae were generally darker in color than normal. Affected kidneys were also frequently enlarged. Petechial hemorrhage was observed on the cortical surface of the kidneys from Rat 225. The microscopic appearance varied depending on how soon the animal was necropsied following exposure and how severe the initial response was. The earliest and most severe lesion was coagulation necrosis of tubular epithelium in the entire renal cortex. Animals which survived this phase showed sloughing of the renal tubular epithelium into the tubular lumen producing granular and hyalin casts which obstructed many tubules. Specimens from survivors showed dilated renal tubules lined by thin basophilic epithelial cells. The interstitial response included congestion, edema, fibrosis, and minor mononuclear inflammatory cell infiltrates. Glomeruli generally appeared uninvolved except where glomerular adhesions accompanied interstitial fibrosis. Females were generally more severely affected than males. Urinary bladders from Rats 206 and 208 contained red-brown urine.

Lung lesions related to exposure were seen only in female rats that died spontaneously. Necropsy lesions included apical lung lobes which were dark red (Rats 218 and 226) and the accumulation of reddish fluid in the thoracic cavity (Rat 209). Microscopic pulmonary lesions included perivascular edema, perivascular hemorrhage, necrosis of perivascular inflammatory cells, congestion of pulmonary vessels, an embolus in the pulmonary artery, and alveolar fibrin deposition. These lesions probably represent secondary vascular effects due to renal failure.

Thymic lesions were also only seen in females dying spontaneously following dosing (Rats 218, 225, 226, 206-210). Necropsy lesions included grey discoloration, hemorrhage, or reduced size. Microscopic lesions included atrophy, cortical necrosis, and hemorrhage. These are likely to be secondary lesions related to stress or agonal events prior to death and not related to direct chemical toxicity.

Heart lesions were seen at necropsy in females dying spontaneously following dosing (Rats 218, 225, and 226). Microscopically, these lesions were seen as foci or areas of myocardial cell necrosis usually with infiltrates of acute inflammatory cells. In Rat 225, thrombi were seen in the heart and in myocardial vessels and some necrotic areas were apparently due to infarction.

Liver lesions were only seen at lethal doses in females (Rats 218, 223, 224, 225, 226, 206, 208, and 210). Necropsy findings were livers that were darker in color than normal probably due to congestion. Four livers were examined microscopically (Rats 218, 225, 226, and 209). Histologic lesions included congestion, swollen hepatocytes, and periportal cytoplasmic vacuoles in hepatocytes.

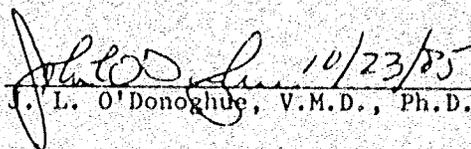
Splenic necropsy lesions included an enlarged spleen in male Rat 459, a small spleen in female Rat 225, and pale spleens in female Rats 206, 208, and 210. Microscopic changes included lymphoid hyperplasia (Rat 459) and atrophy of red and white pulp (Rat 225). It is likely that these changes are secondary or agonal lesions.

Necropsy lesions in the stomach included white discoloration of the non-glandular gastric mucosa in male Rat 466, bile stained gastric mucosa of female Rat 225, hemorrhage into the stomach wall of female Rat 209, and the presence of fluid in the stomach of Rat 209. The abdominal cavity of Rat 209 also contained fluid.

Testicular necropsy lesions included small testes which appeared to be atrophied in Rats 461 and 463 and soft testes in Rat 465. Microscopically, Rat 463 showed focal hypospermatogenesis in which

individual tubules had reduced spermatogenesis. Testes from Rats 463 and 465 appeared histologically normal and no lesions were found which could be correlated with the necropsy lesions.

Abdominal hair on Rat 436 was thinned at the time of necropsy.

 10/23/85
J. L. O'Donoghue, V.M.D., Ph.D.