



NY-94-41136
INIT 87/26/94

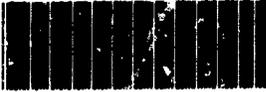
#002084(2)

74-6794-001156

→ Perry, Dynamac

6/8

June 4, 1984



8494888228

Mr. Martin Greif
Executive Secretary
TSCA Interagency Testing Committee
Environmental Protection Agency (TS-792)
401 M Street, SW
Washington, D.C. 20460

Maintain No. 001

Dear Mr. Greif:

The Interagency Testing Committee published its 1983 List of Chemicals Selected for Review in the November 9, 1983 Federal Register. The ITC requested the voluntary submission of relevant environmental, health, and production information. Enclosed please find studies in the possession of Eastman Kodak Company for some chemicals listed in the 1983 List of Chemicals Selected for Review by the TSCA Interagency Testing Committee (48 FR 51520). These chemicals are:

| CAS No. | Chemical |
|-----------------|--|
| 42-#2 78-67-1 ✓ | 2,2'-Azobis(isobutyronitrile) |
| 407 81-55-0 ✓ | 1,8-Dihydroxy-4,5-dinitroanthraquinone |
| 410 87-59-2 ✓ | 2,3-Xylidine |
| 417 98-94-2 ✓ | N,N-Diethylcyclohexylamine |
| 419 100-37-3 ✓ | 2-Diethylaminoethanol |
| 421 102-08-9 ✓ | Thiocarbanilide |
| 423 107-18-6 ✓ | Allyl alcohol |
| 424 107-22-2 ✓ | Ethanedial |
| 426 109-70-6 ✓ | 1-Bromo-3-chloropropane |
| 427 112-41-4 ✓ | Dodecene |
| 430 119-61-9 ✓ | Benzophenone |
| 432 120-78-5 ✓ | 2,2'-Dithiobis(benzothiazole) |
| 433 122-39-4 ✓ | Diphenylamine |
| 435 126-73-8 ✓ | Tributyl phosphate |
| 432 128-39-2 ✓ | 2,6-Di-tert-butylphenol |
| 440 529-34-0 ✓ | 3,4-Dihydro-1(2H)-naphthalenone |
| 441 616-45-5 ✓ | 2-Pyrrolidinone |
| 444 1634-04-4 ✓ | t-Butyl methyl ether |

Please note that none of these chemicals are manufactured by Eastman Kodak Company with the exception of 1,8-dihydroxy-4,5-dinitroanthraquinone.

Sincerely,

RL Raleigh
Robert L. Raleigh, M.D., Director
Health and Environment Laboratories
(716) 722-2879

RLR/sj
Enclosures

Certified Mail

Return Receipt Requested

EASTMAN KODAK COMPANY • 343 STATE STREET • ROCHESTER, NEW YORK 14650

94 JUL 26 PM 3:31
RECEIVED
DPPT/EDIC

HEALTH, SAFETY, AND HUMAN FACTORS LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK

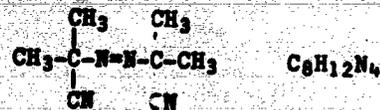
ACC. NO. 906400
LAB. NO. 56-20
59-439

CASE 75-67-1

TOXICITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - flammability, etc.)

CHEMICAL: 2,2'-Azobis[2-methylpropanitrile]

SYNOPSIS: *c,c'*-azodisobutyronitrile



PHYSICAL FORM: Solid
MP or BP in °C: MP 103d.

FORMULA:

TOXICITY:

| | <u>Toxicity</u> <u>Classif.</u> | <u>Rats</u> | <u>Toxicity</u> <u>Classif.</u> | <u>Mice</u> |
|---|------------------------------------|-------------|------------------------------------|-------------|
| Oral LD ₅₀ (mg/kg): ¹ | Moderate | 100-200 | Moderate | 200-400 |

Skin Irritation (G.P.): Slight.¹

Skin Absorption LD₅₀: No evidence of skin absorption at 1.0 g/kg.¹

Skin Sensitization (G.P.): Not a sensitizer.¹

Eye Irritation (Rabbit): Slight.¹

Feeding Study: Five rats were fed 200 mg/kg day of this compound. One died after three days, one after six days and three survived eleven treatments but they lost considerable weight. All rats showed peripheral lividity, the stomachs were distended and the mucosa slightly red. No other gross or microscopic changes were noted.²

Inhalation (Rats): The approximate 4 hour lethal concentration of Vazo 64 is > 12 mg/L. Microscopic examination of the tissues two weeks after the exposure revealed mild hyaline granular degeneration of the kidney tubules in rats of all exposed groups and slight hypotrophy of the thymic medulla in the group exposed to the highest concentration.²

Other: Urine of rats showed increased thiocyanate content roughly proportional to dose.¹ An *in vitro* microbial mutagenicity test on this compound showed that it was not mutagenic either in the presence or absence of a liver microsomal activation system.²

HAZARDS:

Skin: Moderate. Vazo 64 may cause skin irritation.²

Respiratory: Moderate, breathing the dust may cause systemic toxic effects.

Eye: Moderate, may cause eye irritation.²

Other: This compound begins to decompose when heated to 50°C, forming tetramethylsuccinonitrile (a highly toxic solid) and large volumes of nitrogen.

PRECAUTIONARY HANDLING:

Skin: Avoid prolonged skin contact.

Respiratory: Do not breathe the dust or decomposition products.

Eye: Avoid eye contact.

REFERENCES:

1. Unpublished data, Health, Safety, and Human Factors Laboratory; Eastman Kodak Company, Rochester, New York.
2. E. I. DuPont DeNemours and Company, Wilmington, Delaware 19898, Letter dated 11/15/77.

HEALTH HAZARD: (Kodak Park Safety Std. 7.09) **SUMMARIZED BY:** Richard L. Sharp, Ph.D.

R- 2

S- 2

DATE: Revised: June 26, 1978

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

0004

HEALTH, SAFETY, AND HUMAN FACTORS LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK
INTERIM

IR-707
ACC. NO. 911452
LAB. NO. A20-24,40
A23-9
73-611
75-285

CASE 81-55-0 (Does not include physical hazards - flammability, etc.)

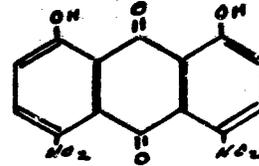
TOXICITY AND HEALTH HAZARD SUMMARY

CHEMICAL: 4,5-Dinitrochrysin

SYNONYMS: 1,8-Dihydroxy-4,5-dinitroanthraquinone

PHYSICAL FORM: Solid
MP or BP in °C: MP 295-301°

FORMULA: C₁₄H₆N₂O₈



TOXICITY:

Oral LD₅₀ (mg/kg):
Intraperitoneal LD₅₀ (mg/kg):

| Toxicity Classif. | Rats |
|----------------------|---------|
| Slight | >3200 |
| Moderate | ca. 400 |
| ***** | |

| Toxicity Classif. | Mice |
|----------------------|---------|
| Slight | >3200 |
| Moderate | ca. 400 |

Skin Irritation (G.P.): Slight
Skin Absorption LD₅₀: Not evident at 1.0 g/kg.
Repeated Skin Irritation: Moderate erythema and a few eschars.
Skin Sensitization (G.P.): Sensitized 7/10, potent activity.

Eye Irritation (Rabbit): Slight

Feeding Study (Rats): 5 rats, 13 days, 1% of diet, no adverse signs although the skin, fur, and most internal organs were stained blue.

Hematology: Normal
Clinical Chemistry: Normal except UN levels were higher than controls.
Necropsy: Liver and kidney weights were within normal range.
Pathology: Normal except for blue color.
Target Organ: None evident.

HAZARDS:

Skin: May cause skin sensitization or irritation upon repeated contact.
Respiratory: Low
Eye: Low

This compound is not known to cause cancer in man. The evidence that it may be an animal carcinogen is of questionable significance. Some substituted anthraquinones were reported to be tumorigenic in animals, while others have given negative results. It could not be ascertained whether the tumorigenic compounds caused benign or malignant tumors. Further testing is underway. This sheet will be revised when results of testing become available.

PRECAUTIONARY HANDLING:

Skin: Avoid repeated or prolonged skin contact.
Respiratory: Do not breathe the dust.
Eye: Avoid contact.

REFERENCES:

1. Toxicology Laboratory Report 77-5; Health, Safety, and Human Factors Laboratory; Eastman Kodak Company; Rochester, New York.

HEALTH HAZARD: (Kodak Park Safety Std. 7.09) **SUMMARIZED BY:** Jay B. Moses, M.D.

R-2
S-2

DATE: Revised February 16, 1978

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

0005

LABORATORY OF INDUSTRIAL MEDICINE
EASTMAN KODAK COMPANY
ROCHESTER, N.Y.

ACC. NO. 904608
LAB. NO. 70-313

TOXICITY AND HEALTH HAZARD SUMMARY

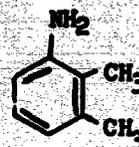
(does not include physical hazards - flammability, etc.)

CAS # 97-59-2

CHEMICAL: 2,3-Dimethylaniline

SYNONYMS: 2,3-Xylidine

PHYSICAL FORM: liquid
MP or BP in °C: BP 87 at 7mm



FORMULA:

$C_8H_{11}N$

TOXICITY:

This compound is moderately toxic orally in rats and slightly toxic in mice. Its LD_{50} is approximately 400 mg/kg and 800-1600 mg/kg in each species respectively. The compound held in contact with the skin of guinea pigs under an occluded covering for 24 hours proved to be a strong skin irritant and showed that it was absorbed through the skin. The LD_{50} by skin absorption is 0.5-1.0 g/kg.¹

HAZARDS:

The damaging skin irritation and the fact that skin absorption occurred make it necessary to prevent skin and eye contact.

PRECAUTIONARY HANDLING:

Protective clothing should be used to prevent skin and eye contact. In case of contact skin and eyes should be washed immediately with copious amounts of water.

REFERENCES:

1. Unpublished data, Laboratory of Industrial Medicine, Eastman Kodak Company, Rochester, New York.

HEALTH HAZARD: (Kodak Park Safety Std. 7.09)

SUMMARIZED BY: Robert L. Roudabush

7 - 1

DATE: December 4, 1970

8 - 3

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

0006

HEALTH AND SAFETY LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 907166
LAB. NO. 74-1

TOXICITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - flammability, etc.)

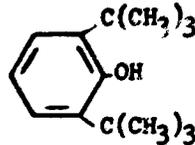
IR-412B

CHEMICAL: 2,6-Di-tert-butylphenol

SYNONYMS: CAS # 128-39-2

PHYSICAL FORM: Solid
MP or BP in °C: MP 33-36°

FORMULA:



C₁₄H₂₂O

TOXICITY:

This compound is slightly toxic to laboratory animals. The oral LD₅₀ is >3200 mg/kg for rats and 1600-3200 mg/kg for mice. When administered intraperitoneally, the LD₅₀ is 1600-3200 mg/kg for rats and 800-1600 mg/kg for mice. When the melted solid was held in occluded contact with guinea pig skin for 24 hours, it caused moderate skin irritation. There was no evidence of systemic toxic effects due to absorption through the intact skin. The skin absorption LD₅₀ is >10.0 cc/kg.

HAZARDS:

This compound is moderately irritating to the skin.

PRECAUTIONARY HANDLING:

Avoid skin and eye contact.

REFERENCE:

- 1) Unpublished data, Health and Safety Laboratory, Eastman Kodak Company, Rochester, New York.

HEALTH HAZARD: (Kodak Park Safety Std. 7.09)

R - 1
S - 2

SUMMARIZED BY: Richard L. Sharp, Ph.D.

DATE: September 11, 1974

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

TL-77-5

Basic Toxicity of 4,5-Dinitrochryszin
Acc. No. 911452, HS&HFL No. 75-285 (73-611)

Asst
81-55-0

Toxicology Section

Written by: C. J. Terhaar

January 24, 1977

0 0 0 8

Basic Toxicity of 4,5-Dinitrochryssazin

Acc. No. 911452, HS&HFL No. 75-285 (73-611)

4,5-Dinitrochryssazin has an oral LD₅₀ greater than 3200 mg/k and an approximate intraperitoneal LD₅₀ of 400 mg/kg in rats and mice. It is a slight skin and eye irritant. It is a potent skin sensitizer in guinea pigs. Repeated skin applications produced moderate erythema and a few eschars. Rats eating in excess of 880 mg/kg/day for 13 days exhibited no adverse signs although their skin, fur and most internal organs were stained blue. The absolute and relative liver weights were greater than the controls but were within normal limits. Hemoglobin concentration, hematocrit, white blood cell count, and differential counts were normal. Serum glutamic oxaloacetic transaminase, glutamic pyruvic transaminase, lactic dehydrogenase, urea nitrogen, alkaline phosphatase and glucose were within normal limits although the mean urea nitrogen levels were higher than the controls. No compound-related gross or microscopic changes were noted on post-mortem examination.

The 96 hour LC₅₀ was approximately 3.2, >100, 15 and 3.2 mg/l for fathead minnows, snails, daphnids and flatworms respectively. The Industrial Laboratory, Kodak Park, reported that the compound had no apparent BOD₅, a BOD₂₀ of 0.013 and a COD of 1.33, both expressed as g O₂/g sample. It does not appear to be readily biodegraded.

CJT:bdo

Summary of Basic Toxicity

Chemical 4,5-Dinitrochrysin

Acc. No. 911852

SSMFL No. 75-285 (73-611)

Date 1-24-77

LD₅₀ (mg/kg)

P.O.

I.P.

Rats

>3200

400

Mice

>3200

400

Remarks:

Skin Irritation (covered) Slight Moderate Strong Absorption: Not evident.

Remarks:

Eye Irritation

Slight

Moderate

Strong

Fluorescein stain
Cornea Adnexa

No. washed

3

No. unwashed

3

Remarks:

Skin Sensitization Potential No. guinea pigs 10

None 3/10

Weak

- Moderate

Potent 7/10

Remarks:

Repeated (10 days) Skin Application (uncovered) No. guinea pigs 10

Remarks: Day 1: Staining and slight erythema. Day 8: Diffuse moderate erythema. Day 10: Few vesicles.

Other Tests

Summary of Basic Toxicity—2

| Repeated Feeding | No. rats/group <u>5</u> | | No. days <u>13</u> | |
|----------------------------|-------------------------|--------------|--------------------|---------------|
| | <u>1.0 %</u> | <u>0.1 %</u> | <u>1.0 %</u> | <u>0.1 %</u> |
| Weight gain | <u>N</u> | <u>N</u> | Hematology | |
| Feed intake | <u>N</u> | <u>N</u> | Egb. | <u>N</u> |
| Signs/behavior | Skin, hair colored | | Hct. | <u>N</u> |
| | blue. Purple colored | | WBC | <u>N</u> |
| Clinical Chemistry: urine. | | | Diff. | <u>N</u> |
| | GOT | <u>N</u> | <u>N</u> | Organ weight: |
| GPT | <u>N</u> | <u>N</u> | Liver | |
| LDH | <u>N</u> | <u>N</u> | Abs. | <u>+2</u> |
| UN | <u>+2</u> | <u>N</u> | Rel. | <u>+2</u> |
| Gluc. | <u>N</u> | <u>N</u> | Kidney | |
| AP | <u>N</u> | <u>+1*</u> | Abs. | <u>N</u> |
| | | | Rel. | <u>N</u> |

*Not considered toxicologically significant.

Pathology Gross: Most internal organs colored blue.
 Micro.: No treatment related lesions.

Repeated Inhalation ND Conc. _____ No. rats _____ No. days _____
 Wt. change _____ Signs/behavior _____
 Hemat.: Hgb. _____ Hct. _____ WBC _____ Diff. _____
 Clin. Chem.: GOT _____ GPT _____ AP _____ LDH _____ UN _____ Gluc. _____
 Pathology _____

Static 96 hour LC₅₀ (mg/l ~~XXXX~~) Dissolved in acetone prior to addition to aquaria.

Fathead minnows 3.2 Snails >100 Daphnids 15 Flatworms 3.2

No effect concn. ND Germination Root Growth Hypocotyl Growth

| | | | |
|----------|--|--|--|
| Ryegrass | | | |
| Radish | | | |
| Lettuce | | | |

Remarks:

Summary of Basic Toxicity--3

No effect concn. ND Early Plant Growth

| | |
|----------|-------|
| Marigold | _____ |
| Radish | _____ |
| Corn | _____ |
| Lettuce | _____ |

Remarks:

Industrial Laboratory (g O₂/g sample)

BOD₅ 0

BOD₂₀ 0.013

TOD ND

COD 1.33

Legend

| | |
|-----------|-----------|
| <u>+</u> | Increased |
| <u>-</u> | Decreased |
| <u>1</u> | Slight |
| <u>2</u> | Moderate |
| <u>3</u> | Great |
| <u>N</u> | Normal |
| <u>ND</u> | Not done |

1-14-77/bdc

0 0 1 2

HEALTH, SAFETY, AND HUMAN FACTORS LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK

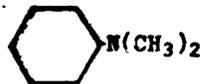
ACC. NO. 908018
LAB. NO. 59-493
77-219

TOXICITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - flammability, etc.)

IR-417

CHEMICAL: N,N-Dimethylcyclohexylamine

SYNONYMS: CAS# 98-94-2



PHYSICAL FORM: Liquid
MP or BP in °C: BP 159

FORMULA:

C₈H₁₇N

TOXICITY:

Toxicity
Classif.

Rats

Toxicity
Classif.

Mice

Oral LD₅₀ (mg/kg):

Moderate

ca. 340

Moderate

ca. 285

Intraperitoneal LD₅₀ (mg/kg):

Moderate

100-200

Moderate

50-100

Skin Irritation (G.P.): Strong

Skin Absorption LD₅₀: 1.0-5.0 ml/kg

Repeated Skin Application: Caused severe skin burns

Skin Sensitization (G.P.): 1/10, weak activity

Eye Irritation (Rabbit): Caused severe damage in both washed and unwashed eyes.

Feeding Study: Rats were fed 0.1 and 1.0% in the diet for 12 days (5 animals per dose). The 1.0% group refused feed and lost weight.

Hematology: 0.1% - normal; 1.0% - normal except for an increased hemoglobin concentration and a decrease in polychromasia.

Clinical Chemistry: 0.1% - normal; 1.0% normal except for a slight decrease in the mean glucose levels.

Necropsy: The absolute mean liver and kidney weights (1.0% group only) were decreased but the mean relative organ weights were normal.

Pathology: No treatment related gross lesions were seen. Histologically, increased adipose (hematopoietic marrow (4/5 rats 1.0% only).

Target Organ: Red cell hematopoietic tissue is probably the primary site of toxic action.

HAZARDS:

Skin: High

Respiratory: Moderate, vapor may cause respiratory tract irritation or systemic toxic effects.

Eye: High

PRECAUTIONARY HANDLING:

Skin: Avoid skin contact

Respiratory: Do not breathe the vapors

Eye: Avoid eye contact

REFERENCES:

1. Toxicology Report 103397N, Health, Safety, and Human Factors Laboratory, Eastman Kodak Company, Rochester, New York.

HEALTH HAZARD: (Kodak Park Safety Std. 7.09)

SUMMARIZED BY: Richard L. Sharp, Ph.D.

R-2

S-3

DATE: Revised August 16, 1978

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

103397N

Basic Toxicity of N,N-Dimethylcyclohexylamine,

Acc. No. 908018, HS&HFL No. 77-219

CA#
98-94-2

Toxicology Section

Written by: C. J. Terhaar

May 5, 1978

0014

Basic Toxicity of N,N-Dimethylcyclohexylamine,

Acc. No. 908018, HS&HFL No. 77-219

The approximate oral LD₅₀ was found to be 337 mg/kg for rats and 283 mg/kg for mice. Tremors and convulsions were noted in the rats. It caused necrosis of the skin when applied either under an occluded patch or on uncovered guinea pig skin. The dermal LD₅₀ was between 1-5 ml/kg. It elicited only a weakly positive reaction in 1/10 guinea pigs when tested for skin sensitization. It caused severe damage in both washed and unwashed rabbit eyes.

Groups of rats were placed on diets containing 1.0%, 0.1% or 0.0% of the compound. These diets resulted in the animals eating approximately 500 mg cpd/kg b.w./day, 89 mg cpd/kg b.w./day or 0.0 mg cpd for 12 days. No behavioral changes were noted in the animals but the high dose group refused feed and lost weight. The high dose group showed a decrease in polychromasia and increased hemoglobin concentration, while their hematocrit, white blood cell count and differential white blood count were normal. The following serum components were evaluated and found to be normal: glutamic oxaloacetic transaminase, glutamic pyruvic transaminase, lactic dehydrogenase, alkaline phosphatase and urea nitrogen. The mean glucose levels of the 1.0% group was slightly decreased. At necropsy, the absolute mean liver and kidney weights (1.0% group only) were decreased but the mean relative organ weights were normal. No treatment related gross lesions were seen. Histologically, 4/5 rats in the 1.0% group showed an increase adipose to hematopoietic

marrow tissue ratio; the marrow hematopoietic tissue, though cytologically normal, was considered to be reduced. The red cell hematopoietic tissue is probably the primary site of toxic action.

Pathhead minnows, daphnids, snails and flatworms all survived a 96 hour static exposure to 100 μ l/l, the highest concentration studied. Germination, hypocotyl growth and root growth were unaffected at 100 μ l/l. The Industrial Laboratory, Kodak Park, reported a COD of 2.2 g O_2 /g sample. BOD and TOD tests could not be run because of insolubility of the sample.

CJT:ldo

0 0 1 6

Summary of Basic Toxicity

Chemical N,N-Dimethylcyclohexylamine (AS# 98-21-2)

Acc. No. 908018 HS&HFL No. 77-219 Date 5-5-78

LD₅₀ (mg/kg) P.O. Rats 337 (240-472)* Mice 283 (188-426)

Remarks: *Tremors and convulsions

Skin Irritation (covered) Slight Moderate Strong Absorption: Not evident

Remarks: LD₅₀ 1.0-5.0 ml/kg

Eye Irritation

| | Slight | Moderate | Strong | Fluorescein stain | |
|--------------|--------|----------|--------|-------------------|--------------------------|
| | | | | Cornea | Adnexa |
| No. washed | | | 3/3* | 3/3 | 3/3 |
| No. unwashed | | | 3/3 | 3/3 | 3/3 (animals sacrificed) |

Remarks: *Iritis and purulent discharge (3/3)

Skin Sensitization Potential No. guinea pigs 10

None 9/10 Weak 1/10 Moderate Potent

Remarks:

Repeated (1 days) Skin Application (uncovered) No. guinea pigs 5

Remarks: Day 1: Eschar formed over entire area by Day 2. Sacrificed.

Other Tests

Summary of Basic Toxicity--2

| Repeated Feeding | No. rats/group <u>5</u> | | No. days <u>12</u> | Carrier <u>none</u> | |
|---------------------|-------------------------|-------------|--------------------|---------------------|-------------|
| | <u>1.0%</u> | <u>0.1%</u> | | <u>1.0%*</u> | <u>0.1%</u> |
| Weight gain | <u>+3</u> | <u>N</u> | Hematology | | |
| Feed intake | <u>+3</u> | <u>N</u> | Hgb. | <u>+1</u> | <u>N</u> |
| Signs/behavior | <u>N</u> | <u>N</u> | Hct. | <u>N</u> | <u>N</u> |
| | | | WBC | <u>N</u> | <u>N</u> |
| Clinical Chemistry: | GOT | <u>N</u> | <u>N</u> | Diff. | <u>N</u> |
| | | | | GPT | <u>N</u> |
| | LDH | <u>N</u> | <u>N</u> | +polychromasia | |
| | AP | <u>N</u> | <u>N</u> | Organ Weight: | |
| | UN | <u>N</u> | <u>N</u> | Liver | |
| | Gluc. | <u>N</u> | <u>N</u> | Abs. | <u>+3</u> |
| | | | | Rel. | <u>N</u> |
| | | | | Kidney | |
| | | | | Abs. | <u>+1</u> |
| | | | | Rel. | <u>N</u> |

Pathology Gross: Normal. Histo.: Increased adipose/hematopoietic marrow tissue ratio; hematopoietic tissue reduced in marrow. (4/5 rats 1.0% only).

Repeated Inhalation ND Conc. _____ No. rats _____ No. days _____
 Wt. change _____ Signs/behavior _____
 Hemat.: Hgb. _____ Hct. _____ WBC _____ Diff. _____
 Clin. Chem.: GOT _____ GPT _____ LDH _____ AP _____ UN _____ Gluc. _____
 Pathology _____

Static 96 hour LC₅₀ mg/l µl/l Added to aquaria in acetone.

Fathead minnows >100 Daphnids >100 Snails >100 Flatworms >100

No effect concn. mg/l µl/l

| | Germination | Hypocotyl Growth | Root Growth |
|----------|-------------|------------------|-------------|
| Ryegrass | <u>100</u> | <u>100</u> | <u>100</u> |
| Radish | <u>100</u> | <u>100</u> | <u>100</u> |
| Lettuce | <u>100</u> | <u>100</u> | <u>100</u> |

Remarks:

0018

August 21, 1978

Addendum to report: "Basic Toxicity of N,N-Dimethylcyclohexylamine,
Acc. No. 908018, HSAHPL No. 77-219"

Histopathologic evaluation of rats given the low dose (0.1%) of
compound in their diets for 12 days has been completed. There were
no significant microscopic lesions detected in bone marrows of these
rats. Moreover, no other compound related lesions were detected.

Mary Katz

Gary V. Katz, Ph.D.
Toxicology Section
Health, Safety, and Human Factors Laboratory

GVK:bdo

0 0 / 2 0

LABORATORY OF INDUSTRIAL MEDICINE
EASTMAN KODAK COMPANY
KODAK PARK

TR - 414
ACC. NO. 900841
LAB. NO. 56-140
57-153

TOXICITY AND HEALTH HAZARD SUMMARY
(does not include physical hazards - flammability, etc.)

CHEMICAL: 2-(Diethylamino)ethanol CAS # 106-37-8

SYNONYMS: N,N-Diethylamino ethanolamine; N,N-Diethyl ethanamine; 2-Hydroxytriethylamine; BDE

PHYSICAL FORM: Liquid

MP or BP in °C: BP = 163°C
FP = -70°C

FORMULA: HO-CH₂-CH₂-N(CH₂CH₃)₂

C₆H₁₅NO

TOXICITY: This compound is slightly toxic orally in both rats and mice having an LD₅₀ of 800-1600 mg/kg in both species. Intraperitoneally it is moderately toxic. LD₅₀ IP in rats is 100-200 mg/kg; in mice it is 50 mg/kg. It is a strong skin irritant when held in contact with guinea pig skin for 24 hours but its action is less severe than butylamine. It appeared to be a sensitizer of low activity to 3/5 guinea pigs tested. One drop caused permanent damage to the cornea of a rabbit.¹ Others have reported the LD₅₀ orally in rats to be 2460 mg/kg. Skin penetration occurs and in rabbits its LD₅₀ is 1.26 ml/kg. Saturated vapors killed 1/5 rats exposed for 8 hours. It caused serious injury to the rabbit eye and when diluted to 5%, it still caused injury. Repeated contact may result in sensitization.²

HAZARDS: This amine is damaging to both eyes and skin and it is absorbed through the intact skin. Although human injury has not been reported from vapor inhalation, the vapors are irritating to the mucus membranes of the eyes and respiratory system and vapor levels should be maintained at or below the currently accepted TLV of 10 ppm. The vapors may have sensitizing properties.

PRECAUTIONARY HANDLING: Eye contact should be prevented by the use of eye protection. Prolonged or repeated contact with skin should be avoided. Contaminating material should be removed from skin as soon as possible.

REFERENCES:

1. Unpublished data, Laboratory of Industrial Medicine, Eastman Kodak Company, Rochester, New York.
2. Union Carbide Communication June 8, 1958.

HEALTH HAZARD (EKCo. Safety Std. 7.09):

SUMMARIZED BY: Robert L. Roudabush

R - 2
S - 3

DATE: July 9, 1968

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

104659A

Basic Toxicity of 2-Pyrrolidinone

Acc. No. 906961, HS&HFL No. 77-335

CAS #

616-45-5

Toxicology Section

Written by: C. J. Terhaar

September 19, 1978

0022

Basic Toxicity of 2-Pyrrolidinone

Acc. No. 906961, HS&HFL No. 77-335

Rats and mice tolerated oral doses as high as 3200 mg/kg. An oral LD₅₀ of 6.5 cc/kg has been reported. When the material was held on the depilated skin of guinea pigs under an occlusive patch for 24 hours, strong irritation was produced. The dermal LD₅₀ in guinea pigs was 1-5 ml/kg. Repeated application to uncovered skin moderately exacerbated the reaction. It has been reported to cause strong irritation to human skin. It is a moderate eye irritant.

Groups of rats were placed on diets containing 1.0%, 0.1% or 0.0% of the compound for 13 days. These diets resulted in the animals eating approximately 770 mg/kg or 80 mg/kg day. All of the animals gained weight normally and showed no signs of toxicity. The high dose group ate slightly less than the other two groups. Hematological profiles consisting of hematocrit, white blood cell count and differential counts were normal. The following serum components were found to be normal: glutamic oxaloacetic transaminase, glutamic pyruvic transaminase, lactic dehydrogenase, alkaline phosphatase, urea nitrogen and glucose. At necropsy, the livers and kidneys of all animals were weighed. The mean absolute and relative organ weights were comparable among all groups except for a slight increase in the mean relative kidney weight of the 1.0% group. No compound related gross or microscopic changes were seen. No site of toxic action was found.

fathead minnow, daphnia, snails and flatworms tolerated an exposure to 100 ul/l during a 96 hour, static test. Germination, hypocotyl and root growth of ryegrass, radish and lettuce were unaffected by a concentration of 100 ul/l. The Industrial Laboratory, Kodak Park, reported a BOD of 1.20, BOD₂₀ of 2.08, a TOD of 2.08 and a COD of 1.50, all expressed as g O₂/g sample. It is concluded that the compound has little toxicity for aquatic animals and terrestrial plants and is rapidly biodegraded.

CJT:jd

0024

Summary of Basic Toxicity

Chemical 2-Pyrrolidinone CAS# 616-45-5

Acc. No. 906961 HS&HFL No. 77-335 Date 9-19-78

LD₅₀ (mg/kg) P.O. Rats >3200 (6.5 cc/kg)* Mice >1200

Remarks:

Skin Irritation (covered) Slight Moderate Strong Absorption: Probable

Remarks: Dermal LD₅₀ 1-5 ml/kg (guinea pigs, strong irritant)
(Strong irritant, human patch tests)*

Eye Irritation

Slight Moderate* Strong Fluorescein stain
Cornea Adnexa

No. washed
No. unwashed

6/6

Remarks:

Skin Sensitization Potential No. guinea pigs 10

None 10/10 Weak Moderate Potent

Remarks: *(Not a potent human sensitizer)

Repeated (10 days) Skin Application (uncovered) No. guinea pigs 5

Remarks: Day 1: Moderate to severe erythema. Slight edema.
Day 10: Same as day 1 along with scattered small eschars.
Moderate exacerbation of reaction.

Other Tests

*Data from GAF Corporation. Experimental work by
Industrial Biology Laboratories, Phila., PA.

0 0 2 5

Summary of Basic Toxicity--2

| Repeated Feeding | No. rats/group <u>5</u> | | No. days <u>13</u> | Carrier <u>None</u> | |
|---------------------|-------------------------|--------------|--------------------|---------------------|--------------|
| | <u>1.0 %</u> | <u>0.1 %</u> | | <u>1.0 %</u> | <u>0.1 %</u> |
| Weight gain | <u>N</u> | <u>N</u> | Hematology | | |
| Feed intake | <u>↓1</u> | <u>N</u> | Hgb. | <u>N</u> | <u>N</u> |
| Signs/behavior | <u>N</u> | <u>N</u> | Hct. | <u>N</u> | <u>N</u> |
| Clinical Chemistry: | | | WBC | <u>N</u> | <u>N</u> |
| | | | Diff. | <u>N</u> | <u>N</u> |
| | | | Organ Weight: | | |
| GOT | <u>N^a</u> | <u>N</u> | Liver | | |
| GPT | <u>N^a</u> | <u>N</u> | Abs. | <u>N</u> | <u>N</u> |
| LDH | <u>N^a</u> | <u>N</u> | Rel. | <u>N</u> | <u>N</u> |
| AP | <u>N</u> | <u>N</u> | Kidney | | |
| UN | <u>N</u> | <u>N</u> | Abs. | <u>N</u> | <u>N</u> |
| Gluc. | <u>N</u> | <u>N</u> | Rel. | <u>↑ 1</u> | <u>N</u> |

a) One animal with elevated values.

Ischemic necrosis of liver (due to torsion of the caudate lobe).

Gross: Normal except for 1 rat (see above). Micro.: No treatment related changes.

Repeated Inhalation MD Conc. _____ No. rats _____ No. days _____

Wt. change _____ Signs/behavior _____

Hemat.: Hgb. _____ Hct. _____ WBC _____ Diff. _____

Clinic. Chem.: GOT _____ GPT _____ LDH _____ AP _____ UN _____ Gluc. _____

Pathology _____

Static 96 hour LC₅₀ ~~mg/l~~ µl/l

Fathead minnows >100 Daphnids >100 Snails >100 Flatworms >100

No effect concn. mg/l µl/l

| | Germination | Hypocotyl Growth | Root Growth |
|----------|----------------|------------------|----------------|
| Ryegrass | <u>>100</u> | <u>>100</u> | <u>>100</u> |
| Radish | <u>>100</u> | <u>>100</u> | <u>>100</u> |
| Lettuce | <u>>100</u> | <u>>100</u> | <u>>100</u> |

Remarks:

8026

EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 905432
LAB. NO. 70-717

TOXICITY AND HEALTH HAZARD SUMMARY

(does not include physical hazards - flammability, etc.)

IR-432

CHEMICAL: 2,2'-Dithiobis(benzothiazole)

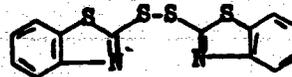
CAS# 120-78-5

SYNONYMS: 2,2'-Dibenzothiazyl disulfide; Benzothiazyl disulfide; Mercaptobenzthiazyl ether

PHYSICAL FORM: solid
MP or BP in °C: MP 180

FORMULA:

$C_{14}H_8N_2S_4$



TOXICITY:

This compound is at most only slightly toxic in laboratory rodents. Its oral LD₅₀ is >3200 mg/kg in rats and mice. Intraperitoneally, the LD₅₀ is >3200 mg/kg in rats and 3200 mg/kg in mice. When held in contact with the skin of guinea pigs for 24 hours under an occlusive covering it proved to be a slight skin irritant. This same test gave no evidence that it was absorbed through the skin. The LD₅₀ by skin absorption is >1 g/kg.

HAZARDS:

These acute data do not suggest any unusual problem involved with industrial handling.

PRECAUTIONARY HANDLING:

No special precautions appear necessary.

REFERENCES:

Unpublished data, Laboratory of Industrial Medicine, Eastman Kodak Company, Rochester, New York.

HEALTH HAZARD: (Kodak Park Safety Std. 7.09)

SUMMARIZED BY: Robert L. Roudabush

R - 1

DATE: June 18, 1971

S - 1

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

0028

LABORATORY OF INDUSTRIAL MEDICINE
EASTMAN KODAK COMPANY
KODAK PARK

ACT. NO. 900105
LAB. NO. 57-421
62-131

TOXICITY AND HEALTH HAZARD SUMMARY
(does not include physical hazards - flammability, etc.)

CHEMICAL: Diphenylamine

CAS #

122-39-4

IR-433

SYNONYMS: DPA

PHYSICAL FORM: Solid

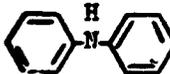
MP or BP in °C:

MP = 53°

BP = 302°

FORMULA:

C₁₂H₁₁N



TOXICITY:

This compound is slightly toxic orally having an LD₅₀ in rats of about 3200 mg/kg. Intraperitoneally, it is moderately toxic with an LD₅₀ in the same species of 200 mg/kg. The solid, moistened slightly with water and held in contact with the skin of guinea pigs for a period of 24 hours, resulted in only very slight skin irritation, and there was no evidence of toxic effects caused by topical application. The LD₅₀ by skin absorption is greater than 2 gm/kg. One case of contact dermatitis in an employee has occurred.¹ In a standard sensitization test the compound appeared to be a sensitizer of low activity to one out of five guinea pigs tested. Studies in other laboratories have indicated that absorption through intact skin is relatively slight but that it can cause rather severe dermatitis. Absorption from the respiratory tract over long periods of time can also cause cyanosis and may have an affect on the hematology of the animal. It has also been reported that in the case of rabbits, a single dose of 500 mg/kg can cause a rapidly fatal diarrhea.²

HAZARDS:

One would expect no more than the ordinary hazard associated with common organic chemicals to be involved with handling of this material in industrial situations.

PRECAUTIONARY HANDLING:

Precautions should be taken to avoid skin contact, ingestion, and inhalation.

REFERENCES:

¹Unpublished Data, Laboratory of Industrial Medicine, Eastman Kodak Company, Rochester, New York

²DuPont bulletin on "Diphenylamine"

HEALTH HAZARD: (Kodak Park Safety Std. 7.09)

SUMMARIZED BY: R. L. Roudsbush

R - 2

DATE:

6/15/71

S - 2

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

0029

EASTMAN KODAK COMPANY
ROCHESTER, N. Y.

ACC. NO. 902957
LAB. NO. A49-13,40,43
A53-5,13
58-322

TOXICITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - flammability, etc.)

SYMBOL: Tri-n-butyl phosphate

CAS #
126-73-8

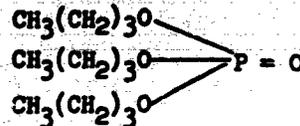
IR-435

SYNOPSIS: Kroniflex TBP

PHYSICAL FORM: Liquid

MP OR BP in °C: BP 154-157/10 MM

FORMULA:



TOXICITY:

This compound is slightly toxic in rats, the LD₅₀ being 1600-3200 mg/kg orally and 800-1600 mg/kg intraperitoneally. In mice it is moderately toxic with an oral LD₅₀ of 400-800 mg/kg and an intraperitoneal LD₅₀ of 100-200 mg/kg. Guinea pigs showed strong skin irritation when the compound was held in contact with their skin for 24 hours under an impervious covering. It is absorbed through the skin and has an LD₅₀ of 10-20 ml/kg in guinea pigs by this route. Atmospheric concentrations of 350 ppm (calculated) for 6 hours killed no rats but was irritating to them while 3800 (calculated) for the same time was more irritating and killed 1/3 exposed rats. Six out of 14 guinea pigs appeared to be sensitive to the compound.¹ Others have reported the oral LD₅₀ in rats to be 3,000 mg/kg and found that in the eye it caused transient irritation similar to ethyl alcohol.¹

HAZARDS:

The compound is both a strong skin and respiratory irritant.

PRECAUTIONARY HANDLING:

Prolonged or repeated skin contact and inhalation of concentrated vapor should be avoided by the use of the proper industrial hygiene measures.

REFERENCES:

1. Unpublished data - Laboratory of Industrial Medicine, Eastman Kodak Company, Rochester, New York.

HEALTH HAZARD (EKO. Safety Std. 7.09):

SUMMARIZED BY: Robert L. Roudabush, Ph.D.

R - 2
S - 2

DATE: November 14, 1968

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

HEALTH, SAFETY, AND HUMAN FACTORS LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 907537
LAB. NO. 82-0011

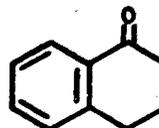
TOXICITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - flammability, etc.)

CHEMICAL: 3,4-Dihydro-1-(2H)-naphthalenone

SYNONYMS: 1-tetralone

PHYSICAL FORM: Liquid

MP or BP in °C: BP 113-116 at 6 mm FORMULA: C₁₀H₁₀O



IR-440

CA# 529-34-6

TOXICITY:

| | <u>Toxicity</u> <u>Classif.</u> | <u>Rats</u> |
|---|------------------------------------|-------------|
| Oral LD ₅₀ (mg/kg): ¹ | Slight | ca. 810 |

Skin Irritation (Rabbit): Moderate¹; Slight(G.P.)²
Skin Absorption LD₅₀: No evidence of skin absorption at 20 mL/kg.²

Eye Irritation (Rabbit): Slight to moderate¹

Inhalation: Six rats exposed to concentrated vapor for 8 hours all survived.¹

HAZARDS:

Skin: Low
Respiratory: Low
Eye: Low

PRECAUTIONARY HANDLING:

Skin: Normal good industrial hygiene practice.
Respiratory: Normal good industrial hygiene practice.
Eye: Normal good industrial hygiene practice.

REFERENCES:

1. American Industrial Hygiene Journal, 30, 470-476 (1969).
2. Unpublished data, Health, Safety, and Human Factors Laboratory, Eastman Kodak Co., Rochester, New York.

HEALTH HAZARD: (Kodak Park Safety Std. 7.09)

SUMMARIZED BY: Richard L. Sharp, Ph.D.

R- 1
S- 2

DATE:

June 8, 1982

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

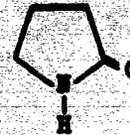
0 0 3 1

HEALTH, SAFETY, AND HUMAN FACTORS LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 906961
LAB. NO. 77-335

TOXICITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - Flammability, etc.)

CHEMICAL: 2-Pyrrolidione CAS # 616-45-5



IR 441

SYNOPSIS:

PHYSICAL FORM: Liquid
MP or BP in °C: MP 24
BP 250

FORMULA: C₄H₇NO

TOXICITY:

| | <u>Toxicity</u> <u>Classif.</u> | <u>Rats</u> | <u>Toxicity</u> <u>Classif.</u> | <u>Mice</u> |
|---|------------------------------------|-------------|------------------------------------|-------------|
| Oral LD ₅₀ (mg/kg): ¹ | Slight | >3200 | Slight | >3200 |
| Oral LD ₅₀ (cc/kg): ² | Slight | 6.5 | | |

Skin Irritation (G.P.): Strong¹
Skin Absorption LD₅₀: 1-5 ml/kg.¹ A strong irritant to human skin.²
Repeated Skin Application: Moderate exacerbation of the reaction.
Skin Sensitization (G.P.): Not a sensitizer to guinea pigs.

Eye Irritation (Rabbit): Moderate

Feeding Study: Rats were fed 0.1% and 1.0% in their diet (5 per dose level) for 13 days. All animals gained weight normally but the high dose group ate slightly less than the others.

Hematology: Normal

Clinical Chemistry: Normal

Necropsy: The mean absolute and relative organ weights were normal except for a slight increase in the mean relative kidney weight of the 1.0% group.

Pathology: No compound related gross or microscopic changes were seen.

Target Organ: None identified.

HAZARDS:

Skin: High
Respiratory: Moderate
Eye: High

PRECAUTIONARY HANDLING:

Skin: Avoid skin contact
Respiratory: Do not breathe the vapors.
Eye: Avoid eye contact.

REFERENCES:

- Tox. Lab. Report No. 104659A, Health, Safety, and Human Factors Laboratory, Eastman Kodak Company, Rochester, New York
- Data from GAF Corporation. Experimental work by Industrial Biology Laboratories, Philadelphia, PA

HEALTH HAZARD: (Kodak Park Safety Std. 7.09) **SUMMARIZED BY:** R. L. Sharp, Ph.D.

R- 2

S- 3

DATE: November 8, 1978

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

0032

LABORATORY OF INDUSTRIAL MEDICINE
EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 907313
LAB. NO. 59-573

TOXICITY AND HEALTH HAZARD SUMMARY

CHEMICAL: tert-Butyl methyl ether CAS # 1634-04-4
SYNONYMS:
PHYSICAL FORM: Liquid
MP or BP in °C: BP 53-56
FORMULA: $(CH_3)_3C-O-CH_3$
 $C_5H_{12}O$

DR-444

TOXICITY

This compound is at most only slightly toxic in rats having an LD₅₀ greater than 1600 mg/kg. It causes only slight skin irritation when held in contact with guinea pig skin under an impervious covering for 24 hours. This same test gave no evidence of toxic effects caused by skin application.

HAZARDS

From the limited data available, this compound does not appear to present hazards different from other ethers. It is probably an anaesthetic and inhalation of high concentrations should be avoided. Ethers also defat the skin and prolonged or repeated contact should be avoided.

PRECAUTIONARY HANDLING

Exposure to high concentrations should be avoided by use of adequate ventilation. Avoid unnecessary skin contact.

LABEL: Suggested Warning Phrases

CAUTION! May be harmful if inhaled.
Use with adequate ventilation.
Avoid prolonged or repeated contact with skin.

REFERENCES

1. Unpublished data, Laboratory of Industrial Medicine, Eastman Kodak Company, Rochester, New York

HEALTH HAZARD: (EKCo. Safety std. 7.09) SUMMARIZED BY: Robert L. Roudabush, Ph.D.

R - 2
S - 1

DATE: October 27, 1966

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

00-33

LABORATORY OF INDUSTRIAL MEDICINE
EASTMAN KODAK COMPANY
ROCHESTER, N.Y.

ACC. NO. 900245
LAB. NO. A75-12,48
A74-23
A27-6,39

TOXICITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - flammability, etc.)

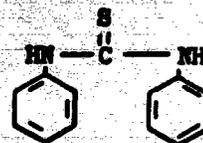
CHEMICAL: Diphenyl thiocarbonyl diimide

CAS#
162-08-9

SYNOPSIS: Thiocarbonyl diimide

PHYSICAL FORM: solid
MP or BP in °C: MP 154

FORMULA:



(C₁₃H₁₂N₂S)

TOXICITY:

This is a slightly toxic compound. In both rats and mice, the oral LD₅₀ is 1600-3200 mg/mg while the intraperitoneal LD₅₀ is 800-1600 mg/kg in rats and 400-800 mg/kg in mice. When a 5% solution in 9:1 acetone:dioxane was held in contact with guinea pig skin under an impervious covering for 24 hours, it produced practically no skin irritation and there was no evidence that it was absorbed through the skin. In guinea pigs, it is not a skin sensitizer and it causes no damage to the rabbit eye.¹ The minimum lethal dose orally in rabbits is said to be 1500 mg/kg.²

HAZARDS:

No unusual hazard is associated with the industrial handling of this compound.

PRECAUTIONARY HANDLING:

No special precautions appear necessary.

REFERENCES:

1. Unpublished data, Laboratory of Industrial Medicine, Eastman Kodak Co., Rochester, N.Y.
2. Merck Index, Merck & Co., Inc., 8th Edition, 1968.

HEALTH HAZARD (EXCo. Safety Std. 7.09):

SUMMARIZED BY: Robert L. Roadabush

R - 1
S - 1

DATE: February 11, 1969

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

0034

IR-423

HEALTH, SAFETY, AND HUMAN FACTORS LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 900518
LAB. NO.

TOXICITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - flammability, etc.)

CHEMICAL: Allyl Alcohol

CAS #
107-18-6

SYNONYMS: 2-Propen-1-ol



PHYSICAL FORM: Liquid
MP or BP in °C: BP 97

FORMULA: C₃H₆O

TOXICITY:

| | Toxicity Classif. | Rats |
|--------------------------------|----------------------|-----------------|
| Oral LD ₅₀ (mg/kg): | Moderate | 64 ¹ |

* * * * *

Skin Irritation: Allyl alcohol is irritating to all tissues but the response may be delayed several hours and then become manifest by muscular spasms.²
Skin Absorption LD₅₀: Absorbed through the skin.²
Eye Irritation: May cause severe eye irritation.²

Other: Allyl alcohol is readily absorbed through the lungs, gastrointestinal tract and skin, leading to widespread irritation of the visceral organs, nephritis, changes in blood pressure and ultimately to convulsions, and possible death.²

HAZARDS:

Skin: High
Respiratory: High
Eye: High

PRECAUTIONARY HANDLING:

Skin: Avoid skin contact.
Respiratory: Do not breathe the vapors.
Eye: Avoid eye contact.

REFERENCES:

1. Smyth and Carpenter, J. Industrial Hygiene Tox., 30, 66 (1948).
2. Hygienic Guide Series, Am. Ind. Hyg. Assoc.

HEALTH HAZARD (Kodak Park Safety Std. 7.09) SUMMARIZED BY: Richard L. Sharp, Ph.D.

R-3
S-3

DATE: September 12, 1978

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

0 0 3 5

DEPARTMENT OF INDUSTRIAL MEDICINE

EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 904435
LAB. NO. 65-543
A-19, P-21, 22, 23, 38
A-18; P-43

TOXICITY AND HEALTH HAZARD SUMMARY

(does not include physical hazards - flammability, etc.)

SYMBOL: Glyoxal

CAS #
107-22-2

IR-424

SYNONYMS: Diformal; Ethanedial; Oxaldehyde; Diformal

PHYSICAL FORM: Liquid
MP or BP in °C:

FORMULA: $\begin{matrix} \text{H} & \text{H} \\ | & | \\ \text{O} & - & \text{C} & - & \text{C} & - & \text{O} \end{matrix}$

$\text{C}_2\text{H}_2\text{O}_2$

TOXICITY:

This compound is moderately toxic for laboratory animals, having an acute oral LD₅₀ of 760 mg/kg. in guinea pigs. (1) This value compares with oral LD₅₀ values of 200-400 mg/kg. in rats, 400-800 mg/kg. in mice and 800-1600 mg/kg. in guinea pigs in our laboratory. (2) By intraperitoneal injection, the LD₅₀ was <100 mg/kg. in rats, 200-400 mg/kg. in mice and 100-200 mg/kg. in guinea pigs. The solution is a moderately strong skin irritant in guinea pigs and has a cutaneous LD₅₀ of >20 ml/kg. The liquid caused moderate irritation in the rabbit eye which cleared within 48 hours without treatment. No permanent eye injury was produced. Industrial handling indicates that the vapors are irritating to the nose and throat.

HAZARDS:

This compound presents a moderate hazard for production of skin irritation. Although skin sensitization has not been reported, as a highly reactive dialdehyde, this possibility should be considered when handling this compound.

PRECAUTIONARY HANDLING:

Personal protective equipment is indicated for the prevention of contact with the skin and eyes. Local ventilation control is also needed for situations where large volumes or where elevated temperatures are involved.

REFERENCES:

1. Smyth, Seaton & Fischer, Journal of Industrial Hygiene and Toxicology, 23: 259-268, 1941
2. Unpublished Data, Laboratory of Industrial Medicine, Eastman Kodak Company, Rochester, New York

HEALTH HAZARD: (Kodak Park Safety Std. 7.09)

SUMMARIZED BY: Warren E. Jones, M. D.

R - 2

DATE: 1-4-71

S - 2

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

0 0 3 6

HEALTH AND SAFETY LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 903119
LAB. NO. 73-623

TOXICITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - flammability, etc.)

CAS #
109-70-6

IR-426

CHEMICAL: 1-Bromo-3-chloropropane

SYNONYMS: Trimethylene chlorobromide

$\text{BrCH}_2\text{CH}_2\text{CH}_2\text{Cl}$

PHYSICAL FORM: Liquid
MP or BP in °C: BP 140-142°

FORMULA: $\text{C}_3\text{H}_6\text{BrCl}$

TOXICITY:

This compound is moderately toxic to laboratory animals. It has an oral LD_{50} of 200-400 mg/kg for rats and approximately 800 mg/kg for mice. When administered intraperitoneally, it has an LD_{50} of approximately 200 mg/kg for rats and 400-800 mg/kg for mice. This material, when held in occluded contact with guinea pigs skin for 24 hours, caused strong skin irritation. There was no evidence that the liquid was absorbed through the intact skin. The skin absorption LD_{50} is >10.0 cc/kg. Using a standard eye irritation test, this compound caused slight to moderate eye irritation in the rabbit. Washing the eye with water reduces the irritant effect. When this compound was tested for its ability to cause skin sensitization in guinea pigs, this material failed to sensitize any of the five guinea pigs to which the standard test was applied.

HAZARDS:

This material presents some hazard if allowed to contact the skin or eyes as it is capable of causing skin burns. Although specific inhalation tests were not performed, it is anticipated that the vapors would be somewhat irritating to the respiratory tract.

PRECAUTIONARY HANDLING:

This compound should not be allowed to contact the skin or eyes. Use with adequate ventilation.

REFERENCES:

- 1) Unpublished data, Health and Safety Laboratory, Eastman Kodak Company, Rochester, New York.

HEALTH HAZARD: (Kodak Park Safety Std. 7.09)

SUMMARIZED BY: Richard L. Sharp, Ph.D.

R - 2
S - 2

DATE: May 22, 1974

FOR THE HEALTH AND SAFETY LABORATORY EASTMAN KODAK COMPANY

HEALTH, SAFETY, AND HUMAN FACTORS LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 910323
LAB. NO. 69-120

IDENTITY AND HEALTH HAZARD SUMMARY
(Does not include physical hazards - Flammability, etc.)

CHEMICAL: 1-Dodecene

CAS#
112-41-4

SYNONYMS: alpha-dodecylene

IR-427

PHYSICAL FORM: liquid
MP or BP in °C: BP 213°



FORMULA: C₁₂H₂₄

TOXICITY:

This compound is, at most, only slightly toxic orally, having an acute oral LD₅₀ of >2000 mg/kg in rats. When held for 24 hours in occluded contact with the skin of guinea pigs, it caused strong skin irritation and caused deaths by this route at doses of 10-20 ml/kg. Instillation into the rabbit eye caused only mild transient irritation. Rats exposed for 6 hours to calculated vapor concentrations of 1-59 mg/l showed no effects attributable to the exposure.

HAZARDS:

This compound presents moderate hazards for skin contact, particularly if prolonged.

PRECAUTIONARY HANDLING:

Avoid skin contact. Remove contaminated clothing promptly and flush involved areas with plenty of water.

REFERENCES:

1. Unpublished data, Laboratory of Industrial Medicine, Eastman Kodak Company, Rochester, New York

HEALTH HAZARD: (Kodak Park Safety Std. 7.09)

R- 1
S- 2

SUMMARIZED BY: Warren H. Jones, M. D.

DATE: September 24, 1969

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

HEALTH, SAFETY, AND HUMAN FACTORS LABORATORY
EASTMAN KODAK COMPANY
KODAK PARK

ACC. NO. 900346
LAB. NO. 79-0377

TOXICITY AND HEALTH HAZARD SUMMARY

(Does not include physical hazards - flammability, etc.)

CHEMICAL: Benzophenone

CAS#
119-61-9

IR-430

SYNONYMS: Diphenyl Ketone

$C_6H_5COC_6H_5$

PHYSICAL FORM: Solid

MP or BP in °C: MP 47-48

BP 305

FORMULA: $C_{13}H_{10}O$

TOXICITY: VP 10 mm/158°C

| | <u>Toxicity</u> <u>Classif.</u> | <u>Rats</u> | <u>Toxicity</u> <u>Classif.</u> | <u>Mice</u> |
|--------------------------------|------------------------------------|-------------|------------------------------------|-------------|
| Oral LD ₅₀ (mg/kg): | Slight | ca. 1900 | Slight | ca. 1900 |

Skin Irritation (G.P.): Slight

Skin Absorption LD₅₀: No evidence of skin absorption at 1.0 g/kg.

Repeated Skin Application: Did not exacerbate the irritative response.

Skin Sensitization (G.P.): Did not sensitize any of the five animals tested.

Eye Irritation (Rabbit): Slight

Feeding Study: Rats were fed 0.1 and 1.0% in their diet for 11 days (five per dose level). The high dose group ate less and gained less weight than the low dose group and controls.

Hematology: Normal

Clinical Chemistry: Normal except for an increase in GPT in the high dose group.

Necropsy: Increased absolute and relative liver and kidney weights in both groups.

Pathology: See Basic Toxicology Report for details.

Target Organ: Liver and possibly bone marrow.

HAZARDS:

Skin: Low

Respiratory: Moderate. Inhalation of the dust may cause systemic toxic effects.

Eye: Low

PRECAUTIONARY HANDLING:

Skin: Normal good industrial hygiene practice.

Respiratory: Do not breathe the dust or vapors.

Eye: Normal good industrial hygiene practice.

REFERENCES:

1. Toxicology Laboratory Report No. 125920C, Health, Safety, and Human Factors Laboratory, Eastman Kodak Company, Rochester, New York.

HEALTH HAZARD: (Kodak Park Safety Std. 7.09) SUMMARIZED BY: Richard L. Sharp, Ph.D.

R-2

S-1

DATE: October 2, 1980

FOR USE ONLY WITHIN EASTMAN KODAK COMPANY

125920C
TX-80-41

Basic Toxicity of Benzophenone, Acc. No. 900346, HS&HFL No. 79-0377

CAS #

119-61-9

Toxicology Section

Written by: W. J. Krasavage

March 5, 1980

0040

125920C
TX-80-41

Basic Toxicity of Benzophenone, Acc. No. 900346, HS&HFL No. 79-0377

The approximate acute oral LD50's of benzophenone was 1900 and 1600 mg/kg body weight for male rats and mice respectively. Clinical signs of toxicity were slight to severe weakness, unkempt hair coats, ataxia and death. The moistened solid held in contact to the depilated abdomen of guinea pigs under an occlusive wrap for 24 hours produced slight skin irritation evidenced by slight erythema and desquamation and slight to moderate edema. Repeated applications (10) to the uncovered clipped backs of guinea pigs produced slight to moderate erythema and minute vesicles initially. This response was not exacerbated by additional treatment. There was no evidence of percutaneous absorption. The acute dermal LD50 was >1g/kg for guinea pigs. None of five guinea pigs tested for allergic skin reactions exhibited a positive response. Several crystals of the compound placed in the conjunctival sacs of six rabbit eyes (three unwashed and three washed) produced slight eye irritation. Irrigation with water immediately after treatments appeared to be beneficial.

Groups of five male rats were fed benzophenone in the diet with 1.0% corn oil at concentrations of 1.0 or 0.1% for 10 consecutive days. These concentrations provided daily doses of 661 and 81 mg/kg respectively. A control group ate a diet containing 1.0% corn oil. The 1.0% rats showed a slightly reduced feed intake resulting in a slight

reduction of body weight gain. A dose-dependent increase was seen in both the absolute and the relative weights of the liver and the relative kidney weights. The absolute weight of the kidneys of the low dosed group but not of the high dosed group was slightly increased statistically. Hematocrit, hemoglobin concentration, total white cell and differential counts, erythrocyte counts and the red cell indices were comparable to the controls. The serum activity of glutamic oxaloacetic transaminase, lactic dehydrogenase, alkaline phosphatase, glucose, sorbitol dehydrogenase and urea nitrogen was not affected by either treatment. The glutamic pyruvic transaminase activity of the high dosed rats was slightly increased compared to the controls. The GPT level of the low dosed rats was normal. No compound related gross pathology was seen. Histologically, mild degenerative effects were found in the liver and the bone marrow. Two of five high dosed rats had rather diffuse bone marrow vacuolation. One of these animals also had minor erythroid hyperplasia. Four of the five high dosed rats showed minor granular hepatic cytoplasm characterized by condensed granular material. One of these rats also showed a moderate increase in eosinophilic staining of the cytoplasm. Increased liver weights, the increased SGPT and the histopathological changes indicate that the liver may be the primary site of toxic action. The bone marrow may also represent a site of toxic action.

WJK:bdo

SUMMARY OF BASIC TOXICITY

Chemical Benzophenone CAS# 119-61-9

Acc. No. 900346 HS&HFL No. 79-0377 Date 3-5-80

LD50 (mg/kg) P.O. Rats 1900 (1350-2670) Mice 1600 (700-3630)

Remarks: Slight to severe weakness, ataxia and death.

Guinea Pig Skin Irritation (covered) LD50 >1 g/kg Absorption: ~~XXXXXX~~

Slight Moderate Strong Severe Not evident

Remarks:

Rabbit Eye Irritation

| | Slight | Moderate | Strong | <u>Fluorescein stain</u> |
|--------------|--------|----------|--------|--------------------------|
| | | | | Cornea Adnexa |
| No. washed | 3/3 | | | |
| No. unwashed | 3/3 | | | |

Remarks: Irrigation with water immediately following treatment appeared to be beneficial.

Skin Sensitization Potential No. guinea pigs 5

None 5/5 Weak Moderate Potent

Remarks:

Repeated (10 days) Skin Application (uncovered) No. guinea pigs 5

Remarks: Slight to moderate erythema, minute vesicles; no exacerbation of response.

Acute Inhalation LC50 mg/m³ ppm Rats _____

Remarks: ND

Other tests:

SUMMARY OF BASIC TOXICITY--2

| Repeated Exposure | Feeding | Drinking Water | Gavage | Inhalation |
|-------------------------|-------------------------|--------------------|--------------------------------|------------|
| No. rats/group <u>5</u> | No. exposures <u>10</u> | No. days <u>11</u> | Carrier <u>corn oil (1.0%)</u> | |
| Units of exposure: | <u>g</u> | <u>mg/kg</u> | <u>mg/m³</u> | <u>ppm</u> |
| Exposure concentration: | <u>1.0</u> | <u>0.1</u> | <u>1.0</u> | <u>0.1</u> |
| Weight gain | <u>+1</u> | <u>N</u> | Hematology: | |
| Feed intake | <u>+1</u> | <u>N</u> | Hgb. | <u>N</u> |
| Daily dose (mg/kg/day) | <u>661</u> | <u>81</u> | Hct. | <u>N</u> |
| Signs/behavior | <u>N</u> | <u>N</u> | WBC | <u>N</u> |
| | | | Diff. | <u>N</u> |
| | | | RBC | <u>N</u> |
| | | | Indices | <u>N</u> |

Clinical chemistry:

| | | |
|-----------------|-----------|----------|
| GOT | <u>N</u> | <u>N</u> |
| GPT | <u>+1</u> | <u>N</u> |
| LDH | <u>N</u> | <u>N</u> |
| AP | <u>N</u> | <u>N</u> |
| U ₁₁ | <u>N</u> | <u>N</u> |
| Glucose | <u>N</u> | <u>N</u> |
| SDH | <u>N</u> | <u>N</u> |

Organ weight:

| | | |
|--------|-----------|-----------|
| Liver | | |
| Abs. | <u>+3</u> | <u>+2</u> |
| Rel. | <u>+3</u> | <u>+2</u> |
| Kidney | | |
| Abs. | <u>N</u> | <u>+1</u> |
| Rel. | <u>+2</u> | <u>+1</u> |

Gross pathology: No compound related changes.

Histopathology: Diffuse bone marrow vacuolation in high dosed rats (2/5).
 Minor erythroid hyperplasia in high dosed rats (1/5).
 Minor granular hepatic cytoplasm in high dosed rats (4/5).
 Moderate increase in eosinophilic staining in liver (1/5).

Site of toxic action: Liver and possibly bone marrow.

Legend

| | |
|-----------|-----------|
| <u>↑</u> | Increased |
| <u>↓</u> | Decreased |
| <u>1</u> | Slight |
| <u>2</u> | Moderate |
| <u>3</u> | Great |
| <u>N</u> | Normal |
| <u>ND</u> | Not done |

4/79:bdo



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