

FORMULARY

FORMULARY FILM DEVELOPER 12

Film Developer 12, equivalent to Edwal 12, is an excellent, fine-grain film developer that gives full emulsion speed, a full contrast range and superb sharpness. The developer contains p-phenylenediamine (paraphenylenediamine), glycin, and metol as the active agents. The p-phenylenediamine produces the extremely fine grain characteristic of this developer, while the glycin and metol provide the speed and contrast.

Developer 12 is not a compensating developer. The negatives are brilliant rather than flat in appearance. Developer 12 reproduces flatter scenes better than other film developers and, as a result, it is an excellent developer for copying or reproducing negatives.

CHEMICALS CONTAINED IN THIS KIT

Your kit will contain the following chemicals:

Kit Size

Chemical	1-liter	2-liter
Metol	6 g	12 g
Sodium sulfite	90 g	180 g
p-phenylenediamine	10 g	20 g
Glycin	5 g	10 g

CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warning on each package. This kit contains two chemicals that need special attention: p-phenylenediamine and metol.

p-Phenylenediamine is very toxic and has been reported to cause cancer in laboratory animals. Use extreme care with this chemical. Wear rubber gloves when working with this compound or its solutions.

If spillage on the skin should occur, wash the area thoroughly with soap and water.

Roll number 4-8 (or 4-18 for the 2 liter kit): Remove and discard 100 ml of the active developer for each roll of film developed and replace it with 100 ml of the "replenisher" (the fresh working solution that was set aside). Use the "Subsequent roll development times" for all rolls of film.

USING THE DEVELOPER

A typical developing sequence at 20°C/68°F is:

- Develop: (See above)
- Stop: 30 seconds
- Fix: 2-4 minutes with Formulary TF-4 Rapid Fix (Cat. No. 03-0141)
- Wash: 30 seconds
- Clear: 2 minutes using Formulary Hypo Clear (Cat. No. 03-0165).
- Wash: 5 minutes in running water.



FORMULARY INC.

PO Box 950 • Condon MT 59826 • 406-754-2891 • FAX 406-754-2896
E-MAIL formulary@montana.com

Clean the work area very carefully using a 1% solution of hydrochloric acid (about 3 ml of concentrated acid per 100 ml of water).

The hydrochloric acid converts the p-phenylenediamine to a water soluble salt making the compound easier to remove.

Metol: Some individuals become sensitized (develop allergic reactions) when using metol. If this should occur, discontinue use and consult a physician.

The user assumes all risks upon accepting these chemicals. **IF FOR ANY REASON YOU DO NOT WISH TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS WITHIN 30 DAYS FOR A FULL REFUND.**

Please consult with local sewer and water authorities regarding proper disposal of darkroom chemicals in your area.

MIXING THE DEVELOPER

We recommend you wear a dust mask, splash goggles, rubber gloves and a rubber apron anytime you are mixing dry chemicals.

To mix the working solution, you will need a 1- or 2-liter storage container, a mixing bowl, and a graduated cylinder or other volume measuring device. A plastic spoon and a funnel will also be useful.

Working Solution

Kit Size

Chemical	1-liter	2-liter
Distilled water (125° F/52° C)	750 ml	1500 ml
Metol	6 g	12 g
Sodium sulfite	90 g	180 g
p-Phenylenediamine	10 g	20 g
Glycin	5 g	10 g
Water (68° F/20° C) to make	1000 ml	2000 ml

Use distilled water and degas it by boiling for three minutes and let cool to 125° F. This will minimize the initial oxidation of the metol.

Place the warm water in a mixing bowl and add a pinch of sodium sulfite. Like boiling, a small amount of sulfite will minimize the initial oxidation of the metol. Use only a small amount of sulfite; larger amounts will prevent the metol from dissolving. Add the metol and stir the mixture to dissolve the solid. After the metol has dissolved, add the sodium sulfite. Again, stir the solution to dissolve the solid.

The p-phenylenediamine is added next followed by the glycin. Be sure each solid is dissolved before the next one is added to the mixture. After all of the solids have been dissolved, add sufficient water to bring the final volume up to 1000 (or 2000) ml, then transfer it to its storage container. Be sure to clean all mixing utensils thoroughly.

LIFE OF THE WORKING SOLUTION

The shelf life of the working solution is about 6 months in a full, tightly-capped bottle.

CAPACITY AND DEVELOPMENT TIMES

The capacity of the developer depends upon the method of use. The most economical method for use is a replenishment procedure, the description for which is given below.

The development times also depend upon the method by which the developer is used. The fresh developer is more active than the partially spent developer. When using replenishment, a shorter development time is used for the first roll of film, but all subsequent rolls are developed using a longer time.

The development times given below are only suggested starting values. Your exact time may vary depending upon your agitation technique and contrast requirements.

Working Solution

Development Time

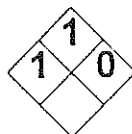

Film Type	First Roll	Subsequent Rolls
Plus X	5-7 minutes	7-9 minutes
Tn X	6-9 minutes	8-11 minutes
HP 4	6-9 minutes	8-11 minutes

Using a 500 ml stainless steel developing tank, the following replenishment procedure should be followed.

Use 500 ml of the working solution as the active developer and set aside 500 (or 1500) ml of the working solution as the replenisher. Do not mix the active working solution and the replenisher except as described below.

Roll number 1-3: Use the "First Roll" recommended development time for the initial roll of film, and the "Subsequent Roll" time for the next two rolls. No replenishment is necessary.

Material Safety Data Sheet

NFPA	HMIS		Personal Protective Equipment						
	<table border="1"> <tr> <td>Health Hazard</td> <td style="text-align: center;">(2)</td> </tr> <tr> <td>Fire Hazard</td> <td style="text-align: center;">(1)</td> </tr> <tr> <td>Reactivity</td> <td style="text-align: center;">(0)</td> </tr> </table>	Health Hazard	(2)	Fire Hazard	(1)	Reactivity	(0)	 See Section 15.	
Health Hazard	(2)								
Fire Hazard	(1)								
Reactivity	(0)								

Section 1. Chemical Product and Company Identification			
Common Name/ Trade Name	METOL	Code	M4060
Manufacturer	SPECTRUM CHEMICAL MFG. CORP. 14422 SOUTH SAN PEDRO STREET GARDENA, CALIFORNIA 90248-9985	CAS#	55-55-0
Commercial Name(s)	Not available	RTECS	SL8650000
Synonym	Methyl-p-aminophenol Sulfate	TSCA	On the TSCA list.
Chemical Name		CI#	Not available.
Chemical Family	Not available.	<u>In case of emergency</u>	
Chemical Formula	C14H20N2O6S	CHEMTREC (24hr) 800-424-9300	
Supplier	SPECTRUM QUALITY PRODUCTS 14422 S. SAN PEDRO STREET GARDENA, CA 90248-9985	Emergency phone: (310) 516-8000	

Section 2. Composition and Information on Ingredients					
			<i>Exposure Limits</i>		
Name	CAS#	TWA (mg/m3)	STEL (mg/m3)	CEIL (mg/m3)	% by Weight
METOL	55-55-0				100
Toxicological Data on Ingredients	METOL:				

Section 3. Hazards Identification	
Potential Acute Health Effects	Slightly dangerous to dangerous in case of eye contact (irritant), of ingestion. Very slightly to slightly dangerous in case of skin contact (irritant), of inhalation. This product may irritate eyes and skin upon contact.
Potential Chronic	Slightly dangerous to dangerous in case of eye contact (irritant), of ingestion. Very slightly to slightly dangerous in case of skin contact (irritant), of inhalation. CARCINOGENIC EFFECTS: Not available.

Products of Combustion	These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...).
Fire Hazards in Presence of Various Substances	No specific information is available in our database regarding the flammability of this product in presence of various materials.
Explosion in Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. No specific information is available in our database regarding the product's risks of explosion in the presence of various materials.
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO2, water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.
Special Remarks on Fire Hazards	No additional remark.
Special Remarks on Explosion Hazards	No additional remark.

Section 6. Accidental Release Measures	
Small Spill	Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
Large Spill	Our database contains no additional information in case of a spill and/or a leak of the product. Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7. Handling and Storage	
Precautions	Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. DO NOT ingest. DO NOT breathe dust. Avoid contact with eyes. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label.
Storage	Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8. Exposure Controls/Personal Protection	
Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Wear appropriate respirator when ventilation is inadequate.
Personal	Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient;

Toxicity to Animals LD50: Not available. LC50: Not available.

Chronic Effects on Humans Toxicity of the product to the reproductive system: Not available.

Other Toxic Effects on Humans Slightly dangerous to dangerous in case of eye contact (irritant), of ingestion. Very slightly to slightly dangerous in case of skin contact (irritant), of inhalation.

Special Remarks on Toxicity to Animals No additional remark.

Special Remarks on Chronic Effects on Humans No additional remark.

Special Remarks on other Toxic Effects on Humans No additional remark.

Section 12. Ecological Information

Ecotoxicity Not available.

BOD5 and COD Not available.

Products of Biodegradation These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂...).

Toxicity of the Products of Biodegradation The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation No additional remark.

Section 13. Disposal Considerations

Waste Disposal Recycle to process, if possible. Consult your local or regional authorities.

Section 14. Transport Information

DOT Classification Not a DOT controlled material (United States).

Identification Not applicable (PIN and PG).

Special Provisions for Transport Not applicable.

DOT (Pictograms)

Other Classifications

WHMIS (Canada)

WHMIS CLASS D-2B: Material causing other toxic effects (TOXIC).

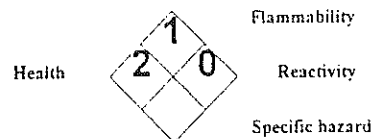
DSCL (EEC)

Not controlled under DSCL (Europe).

HMIS (U.S.A.)

Health Hazard	1
Fire Hazard	1
Reactivity	0
Personal Protection	0

National Fire Protection Association (U.S.A.)



Personal Protective Equipment



Protective Gloves (impervious).



Lab coat.



Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.



Splash goggles.

PORT NUMBER: 703
DS NO: GC003068
EFFECTIVE DATE: 11/23/92

VERSION: 002

PRODUCT: SODIUM SULFITE
10-1340

ORDER NO: 141120
PROD NO: 503217

PHOTOGRAPHERS FORMULARY
C/O UNITED FRT. TERMINAL

KALISPELL, MT 59806

VAN WATERS & ROGERS INC., SUBSIDIARY OF UNIVAR (206)889-3400
200 CARILLON POINT, KIRKLAND, WA 98033

----- EMERGENCY ASSISTANCE -----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC
(800)424-9300

SKI

----- FOR PRODUCT AND SALES INFORMATION -----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE AT
VW&R SPOKANE 509-534-0405 SPOKANE, WA

PRODUCT NAME:
SODIUM SULFITE

DS #: GC003068

GENERAL INFORMATION

TRADE NAME (COMMON NAME): SODIUM SULFITE, SULFTECH(TM) grade Sodium Sulfite
I.A.S. No. 7757-83-7
CHEMICAL NAME AND/OR SYNONYM: Sodium Sulfite
FORMULA: Na2SO3
MOLECULAR WEIGHT: 126.04
ADDRESS: GENERAL CHEMICAL CORPORATION
90 East Halsey Road
Parsippany, NJ 07054-0389
LOCAL CONTACT: Manager of Product Safety
LOCAL PHONE NUMBER: (201) 515-1840
CURRENT ISSUE DATE: July, 1990

FIRST AID MEASURES

EMERGENCY PHONE NUMBER: (800) 631-8050
EYES: Immediately flush with plenty of water, for at least 15 minutes. Get medical attention.
SKIN: Promptly wash with plenty of soap and water.
INHALATION: Remove to fresh air. If symptoms persist, get medical attention.

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INGESTION: If conscious, immediately give 2 to 4 glasses of water or milk and induce vomiting by touching finger to back of throat. Get immediate medical attention.

2. HAZARDS INFORMATION

HEALTH -

INHALATION: Inhalation of product dust or mist may irritate respiratory tract. Contact with acids liberates irritating and potentially fatal sulfur dioxide gas.

INGESTION: Ingestion may irritate gastrointestinal tract. Estimated to be moderately toxic. May cause severe allergic reaction in some asthmatics and sulfite sensitive individuals. Large doses may cause violent colic and diarrhea, circulatory disturbances, central nervous system depression and even death.--Reference (a).

SKIN: Dust or mist may cause skin irritation from prolonged contact. Solutions will irritate. See pH, Section F. Rabbit and guinea pig data available, Reference (b).

EYES: Dust or mist may irritate or burn eyes. Solutions will irritate or burn. See pH, Section F.

PERMISSIBLE CONCENTRATION: AIR: (SEE SECTION J)
None established for sodium sulfite.
OSHA/TWA for SO₂ = 2 ppm
OSHA/STEL for SO₂ = 5 ppm
BIOLOGICAL: None established.

UNUSUAL CHRONIC TOXICITY: See Section K.

FIRE AND EXPLOSION -

FLASH POINT: Not flammable.

AUTO IGNITION TEMPERATURE: NA

FLAMMABLE LIMITS IN AIR (% BY VOL.): LOWER - NA UPPER - NA

UNUSUAL FIRE AND EXPLOSION HAZARDS: See Hazardous Decomposition Products, Section G.

3. PRECAUTIONS/PROCEDURES

FIRE EXTINGUISHING AGENTS RECOMMENDED: NA

FIRE EXTINGUISHING AGENTS TO AVOID: NA

SPECIAL FIRE FIGHTING PRECAUTIONS: Wear NIOSH-approved self-contained breathing apparatus. Use water-spray to keep containers cool, and to knock down fumes.

VENTILATION: LOCAL EXHAUST if dusty or misty condition prevails.
LOCAL EXHAUST if there is release of sulfur dioxide gas, see Section G.
Keep incompatible materials out of hoods, ducts, etc.

NORMAL HANDLING: Avoid contact with eyes, skin, clothing. Avoid breathing dust or mist. Use with adequate ventilation.

STORAGE: Store in a cool, dry area, away from acids or oxidizers.
Keep container closed. Protect from physical damage.

SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT - SECTION E):

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Promptly shovel up dry chemical into an empty container, and cover. Store as above. Cautiously spray residue with plenty of water. (See Section I for disposal methods.)

SPECIAL: PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS: SIGNAL WORD - WARNING!
Contact with acids releases irritating and potentially fatal sulfur dioxide gas. See drum-handling instructions on label. When dissolving, add water cautiously and with stirring.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: If dusty or misty conditions prevail, use dust or mist respirator approved by NIOSH. If sulfur dioxide should be released (see Section G), use respiratory protection approved by NIOSH for this gas.--Reference (c).

EYES AND FACE: If exposed to dust or mist or solution, wear hard hat (or other head covering) and chemical safety goggles. Do not wear contact lenses.

HANDS, ARMS, AND BODY: Wear full work-clothing, including long-sleeved shirt and trousers for routine product-handling. Cotton gloves are usually adequate for dry product. For solutions, wear impervious gloves and apron. If contact is repeated or prolonged, wear full impervious clothing.

OTHER CLOTHING AND EQUIPMENT: Eyewash facility.

PHYSICAL DATA

STATE OF MATERIAL IS (AT NORMAL CONDITIONS): SOLID

APPEARANCE AND ODOR: White granular crystals or powder. Odorless.

MELTING POINT: Decomposes 900 Degrees C

BOILING POINT: ND

SPECIFIC GRAVITY (H2O=1): 2.63

VAPOR DENSITY (AIR=1): NA

SOLUBILITY IN WATER (% by Weight): (Calculated as the anhydrous salt)
17% solution at 10 Degrees C
28% solution at 33.4 Degrees C

pH: 1% solution; pH=9.8 (approx.)

VAPOR PRESSURE (mm Hg at 20 Degrees C): NA

EVAPORATION RATE (Ether=1): NA (Butyl Acetate = 1): NA

PERCENT VOLATILES BY VOLUME (At 20 Degrees C): NA

REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: High temperature (before melting); yield sulfur dioxide gas and hazardous residue (details below).

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS cause vigorous exothermic reactions.

ACIDS release sulfur dioxide gas (details below).

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HAZARDOUS DECOMPOSITION PRODUCTS: SULFUR DIOXIDE GAS: toxic and corrosive.
SODIUM SULFIDE RESIDUE: flammable, dangerous fire risk, strong irritant
to skin and tissue, incompatible with acids.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: NA

H. HAZARDOUS INGREDIENTS (Mixtures Only)

MATERIAL OR COMPONENT/C.A.S. #: Not Applicable.

I. ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY:

Aquatic Toxicity: 2600 ppm/24, 48 & 96 hr/mosquito fish/TLM/fresh water.
Biological Oxygen Demand (BOD): 0.12 lb/lb, instantaneous.--Reference (d).
OCTANOL/WATER PARTITION COEFFICIENT: NO

EPA HAZARDOUS SUBSTANCES (CLEAN WATER ACT SEC. 311): NO

IF SO REPORTABLE QUANTITY: -- (40 CFR 116-117)
WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL
DISPOSAL OR DISCHARGE LAWS): Dissolve in water, using caution as solution
can get hot. Neutralize with acid and flush to sewer with plenty of water
if permitted by applicable disposal regulations. Good ventilation is
required during neutralization due to release of SO₂ gas. Oxidation to
sodium sulfate solution may be required, as for example, by adding a
slight excess of dilute hydrogen peroxide carefully and with stirring.
Neutralized waste may have to be disposed of by an approved contractor.
RCRA STATUS OF UNUSED MATERIAL IF DISCARDED: Not a "hazardous waste".
HAZARDOUS WASTE NUMBER: (IF APPLICABLE): NA (40 CFR 261)

J. REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES:

None.

REGULATORY STANDARDS:

FDA regulations apply to the use of food grade material (21 CFR).

D.O.T. CLASSIFICATION: Not Regulated (49 CFR 173)

GENERAL:

- (a) Monograph 139, "Sulfite Salts", Gosselin, R.E. et al., CLINICAL TOXICOLOGY OF COMMERCIAL PRODUCTS, 4th Ed., 1976.
- (b) NIOSH, REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, 1981-82, P881 - 154478, No. WE215 00 00.
- (c) NIOSH/OSHA "Pocket Guide to Chemical Hazards", DHHS (NIOSH) Pub. No. 78-210, 1978, Gov't. Printing Office, Washington 20402.
- (d) Coast Guard CHRIS system form SSF, "Sodium Sulfite", Oct. 1978.

K. ADDITIONAL INFORMATION

Sodium sulfite has been demonstrated to be mutagenic in microbial systems;

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However, it is not mutagenic in studies involving insects and is not considered to present a mutagenic threat to multicell organisms, (i.e. animals, humans).

This product is not for drug or food use unless so labeled. If a food grade product, the following applies;

- 1) Effective July 9, 1986, the FDA has banned the use of "Sulfiting Agent" or "Sulfites" on fruits and vegetables intended to be served or sold raw to consumers.
- 2) Effective July 9, 1987, the FDA is requiring when a sulfite is present in a detectable amount in a finished food, regardless of whether it has been directly or indirectly added via one or more of the food ingredients, it must be declared on the label. The regulation defines a "detectable amount" of sulfite to be 10 ppm.
- 3) Sulfiting agents or sulfites are not to be used on foods or meats recognized as a source of Vitamin B1.

FOOTNOTE: ND = NOT DETERMINED NA = NOT APPLICABLE
* = PROPRIETARY - TRADE SECRET

PFALTZ & BAUER, INC.

P11180

172 EAST AURORA ST. (203) 574-0075
WATERBURY, CT 06708

10-0890

MATERIAL SAFETY DATA SHEET

CHEMTREC 1-800-424-9300

MATERIAL IDENTIFICATION

p-Phenylenediamine

MSDS NUMBER : P11180

Revision Date : 10-Apr-91

Date Printed : 17-May-91

GRADE : TECHNICAL

CHEMICAL FAMILY : AROMATIC AMINE

TRADE NAMES / SYNONYMS

PPD

p-Diaminobenzene

CAS NAME : 1,4-BENZENEDIAMINE

CAS NUMBER : 106-50-3

FORMULA : C₆H₄(NH₂)₂

MOLECULAR WEIGHT : 108.14

TSCA INVENTORY STATUS : Reported/Included

NPCA-HMIS RATINGS : Health: 2 Flammability: 1 Reactivity: 1
Personal Protection rating to be supplied by
user depending on use conditions.

COMPONENTS

<u>Material</u>	<u>CAS Number</u>	<u>%</u>
*p-PHENYLENEDIAMINE	106-50-3	99.5
ANILINE	62-53-3	0.01

* Regulated as a Toxic Chemical under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

PHYSICAL DATA

Boiling Point : 271 deg C (520 deg F) at 760 mm Hg.
Vapor Pressure : 0.0038 mm Hg at 25 deg C (77 deg F)
 : 1.0797 mm Hg at 100 deg C (212 deg F)
Vapor Density : 3.7 (Air = 1.0)
Melting Point : 141 deg C (286 deg F)
Evaporation Rate : (Butyl Acetate = 1.0) Less than 1
Water Solubility : 10 WT % at 40 deg C (104 deg F) 86.6 WT % at 107 deg
 C (225 deg F)
pH : 9.45 (Water extract)
Odor : Slight aromatic
Form : Solid (flakes); Liquid (molten)
Color : Light pink to tan (darkens on storage)
Specific Gravity : 1.04 at 160 deg C (320 deg F)

HAZARDOUS REACTIVITY

Instability : Stable at normal temperatures and storage
 conditions. Moist air and excessive heat may cause
 product quality to degrade.
Incompatibility : Incompatible with oxidizing agents.
Decomposition : Decomposes to carbon monoxide and nitrogen oxides if
 overheated.
Polymerization : Polymerization will not occur.

FIRE AND EXPLOSION DATA

Flash Point : 154 deg C (309 deg F)
Method : TCC
Autoignition : Not available
Autodecomposition: Not available

Flammable Limits in Air, % by Volume
LEL: Minimum Ignitable Concentration (Dust in
Air) = 0.025 g/L
UEL: Not available

FIRE AND EXPLOSION HAZARDS

OSHA Class IIIB Combustible Material; follow appropriate
National Fire Protection Association (NFPA) codes for
handling and storage facilities. Dust can form explosive
mixtures in air. Hazardous carbon monoxide and nitrogen
oxides may be produced in a fire.

EXTINGUISHING MEDIA

Small Fires: Dry chemical, carbon dioxide (CO2).
Large Fires: Water spray, fog, or foam.

(FIRE AND EXPLOSION DATA - Continued)

SPECIAL FIRE FIGHTING INSTRUCTIONS

Isolate hazard and evacuate area. Stay upwind and avoid smoke and fumes. Use water spray to cool tanks and reduce vapors. CAUTION: Contact between water and molten material may cause spattering. If smoke and fumes cannot be avoided, wear full protective clothing with hood and breathing air supply. Runoff from fire control may cause pollution.

HEALTH HAZARD INFORMATION

Harmful to liver or kidneys if inhaled, swallowed, or absorbed through skin. Causes eye, skin, nose, and throat irritation. May cause allergic skin or lung reactions.

ANIMAL DATA:

Inhalation 4-hour LC50: 0.92 mg/L (aerosol) in rats
Skin Absorption ALD : 5000 mg/kg in rabbits
Oral LD50 : 80 mg/kg in rats

The compound is a moderate eye irritant, a mild skin irritant, and a skin sensitizer in tests with laboratory animals. Toxic effects described in animals from single, near-lethal, inhalation exposures include weight loss, diarrhea, incoordination, and cyanosis. When exposed repeatedly, sensitized animals had difficulty in breathing. By ingestion, animals receiving single, high doses showed decreased activity and general malaise. Repeated ingestion exposures caused liver and kidney damage, and irritation of the gastrointestinal tract.

Tests in animals demonstrate no carcinogenic activity, developmental toxicity, or genetic damage. It does produce genetic damage in bacterial and mammalian cell cultures. It does not produce heritable genetic damage. Tests for reproductive effects have not been performed.

HUMAN HEALTH EFFECTS:

Human health effects of overexposure by skin contact include skin irritation with discomfort or rash. In susceptible individuals, the compound may cause skin sensitization with allergic skin rashes. Effects of overexposure by eye contact may include eye irritation with discomfort, tearing, or blurring of vision. By inhalation, effects may include nonspecific discomfort such as nausea, headache, or weakness; irritation of the upper respiratory passages including runny nose or cough; asthma-like reactions with shortness of breath, wheezing, or cough, possibly occurring on subsequent reexposure to concentrations below established exposure limits. By ingestion, effects may include nonspecific discomfort such as nausea, headache, or

(HEALTH HAZARD INFORMATION - Continued)

weakness. Ingesting large amounts of p-phenylenediamine has been reported to cause vomiting and visible swelling of the face and neck. In severe cases, the inside of the throat can swell enough to make breathing difficult.

Animal data suggest higher or repeated exposures may cause abnormal liver or kidney function, as detected by laboratory tests, or gastrointestinal tract irritation.

Individuals with preexisting diseases of the skin, liver, kidneys, or lungs may have increased susceptibility to the toxicity of excessive exposures.

CARCINOGENICITY

None of the components in this material is listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.

EXPOSURE LIMITS

p-Phenylenediamine

AEL * : 0.1 mg/m³ - 8 Hr. TWA - Skin
TLV (ACGIH) : 0.1 mg/m³ - 8 Hr TWA
See Notice of Intended Changes (1990-91)
Delete skin notation. - Skin
PEL (OSHA) : 0.1 mg/m³ - 8 Hr TWA - Skin
Other : *SEE ADDITIONAL INFORMATION SECTION FOR
A DEFINITION OF THE "SKIN" NOTATION

OTHER APPLICABLE EXPOSURE LIMITS

ANILINE

AEL * : 2 ppm, 8 & 12 Hr. TWA - Skin
TLV (ACGIH) : 2 ppm, 7.6 mg/m³ - 8 Hr TWA
(and homologues) - Skin
PEL (OSHA) : 2 ppm, 8 mg/m³ - 8 Hr TWA
(and homologues) - Skin

* AEL is Acceptable Exposure Limit.

SAFETY PRECAUTIONS

Do not get in eyes, on skin, or on clothing. Do not breathe dust or vapor. Wash thoroughly after handling.

FIRST AID

INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

In case of contact, immediately wash skin with soap and

water. Wash contaminated clothing before reuse. Call a physician. If molten material gets on skin, cool rapidly with cold water. Do not attempt to peel material from skin. Obtain medical treatment for thermal burns.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, do not induce vomiting. Immediately give two glasses of water or activated charcoal slurry. Never give anything by mouth to an unconscious person. Call a physician.

NOTES TO PHYSICIAN

To prepare activated charcoal slurry, suspend 50 gm of activated charcoal in 400 mL of water and shake well. Give 5 mL/kg of body weight, or 350 mL for an average adult.

Severe overexposure may cause facial, pharyngeal, and occasionally, laryngeal edema. Death may be rapid due to acute respiratory distress. Less severe cases have responded to corticosteroids and antihistamines; more severe cases have required tracheostomy.

PROTECTION INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES AND PRECAUTIONS

Good general ventilation should be provided to keep dust and vapor concentrations below the exposure limit and prevent the formation of explosive dust mixtures in air.

PERSONAL PROTECTIVE EQUIPMENT

Have available and use as appropriate:

EYE/FACE PROTECTION: Wear safety glasses (side shields preferred) or coverall chemical splash goggles. Additionally, wear a full-length face shield where the possibility exists for face contact due to splashing or spraying of material.

RESPIRATORS : A NIOSH/MSHA approved air purifying respirator with a high efficiency dust filter (HEPA) and organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is

(PROTECTION INFORMATION - Continued)

limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, when exposure levels are not known, or in any other circumstances where air purifying respirators may not provide adequate protection.

PROTECTIVE CLOTHING: Where there is potential for skin contact, have available and wear as appropriate: butyl or neoprene gloves; butyl apron, pants, jacket, hood, and boots; or, totally encapsulating chemical suit with breathing air supply. Where there is potential for contact with hot/molten material, wear heat resistant clothing.

DISPOSAL INFORMATION

AQUATIC TOXICITY

The compound is moderately to extremely toxic. 96-hour LC50 in fathead minnows is 0.028 mg/L. 96-hour LC50 in rainbow trout is 3.9 mg/L.

SPILL, LEAK, OR RELEASE

NOTE: Review FIRE AND EXPLOSION HAZARDS and SAFETY PRECAUTIONS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Evacuate area and keep upwind of spill. If molten, contain spill with sand or earth dam. Allow to solidify and transfer to a covered metal container for disposal. Avoid causing dust. Flush area with detergent and water. Water spray may be used to control and disperse vapors. Comply with Federal, State, and local regulations on reporting releases. The CERCLA Reportable Quantity for this product is 1 lb.

WASTE DISPOSAL

Comply with Federal, State, and local regulations. If approved, may be incinerated, sent to an approved hazardous material disposal area, or transferred to a licensed disposal contractor.

SHIPPING INFORMATION

DOT

Proper Shipping Name : PHENYLENEDIAMINE, PARA, SOLID *
Hazard Class : ORM-A
UN/NA No. : UN 1673
Special Information: *REG. AS HAZARDOUS MATERIAL BY DOT ONLY WHEN SHIPPED BY AIR.

DOT/IMO

Proper Shipping Name : PHENYLENEDIAMINES
Hazard Class : POISON B, 6.1
UN No. : 1673
DOT/IMO Label : ST. ANDREW'S CROSS
Special Information: FLASH POINT: 154 DEG C (309 DEG F)
Packaging Group : III

Shipping Containers

Tank Car - (Molten)
Tank Truck - (Molten)
Fiber Drums - (Flakes)

STORAGE CONDITIONS

Store inside in a cool, dry, well-ventilated area away from heat, sparks, and flame. Do not store with strong oxidizing materials. Keep containers upright and tightly closed.

TITLE III HAZARD CLASSIFICATIONS

Acute : Yes
Chronic : Yes
Fire : No
Reactivity : No
Pressure : No

LISTS:

Extremely Hazardous Substance -No
CERCLA Hazardous Substance -Yes
Toxic Chemical -Yes

CANADIAN WHMIS CLASSIFICATION
D-1B; D-2B

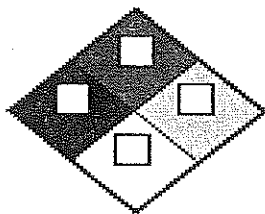
ADDITIONAL INFORMATION AND REFERENCES

Warning: This product contains a trace substance (aniline) known to the State of California to cause cancer.

*INFORMATION CONTINUED FROM OTHER EXPOSURE LIMITS

The "Skin" notation indicates that the compound is capable of penetrating skin and mucous membranes. Therefore, control of vapor inhalation alone may not be sufficient to prevent an excessive dose; skin contact should be avoided.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.



Material Safety Data Sheet
 May be used to comply with
 OSHA's Hazard Communication Standard
 29 CFR 1910.1200 Standard must be
 Consulted for specific requirements

U.S. Department of Labor
 Occupational Safety And Health Administration
 (Non-Mandatory Form)
 Form Approved
 OMB No. 1218-0072

Identity (as used on label and list) Glycin CAS# 122-87-2	Note: Blank spaces are permitted, if any item is not applicable, or no information is available, the space must be marked to indicate that.
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Section I

Manufacturer's Name: Photographer's Formulary, Inc.	Emergency Telephone Number: 800-424-9300
Address (Number Street, City, State and Zip): Po Box 950 Condon MT 59826	Telephone Number for Information: 406-754-2891 / 800-922-5255
	Date Prepared: October 19, 2004

Section II – Hazardous Ingredients/Identity Information

Hazardous components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits	% Optional
Chemical Name or Synonym: N- (P-Hydroxyphenyl) (Glycine)				
Chemical Family: Carboic Acid-Alcohol				
Formula: H0C6 H4NHCH2COOH				

Section III – Physical/Chemical Characteristics:

Boiling Point:	NA	Specific Gravity:	NA
Vapor Pressure: (mm Hg)	NA	Melting Point	230°
Vapor Density (AIR=1)	NA	Evaporation Rate (Butyl Acetate =1)	NA
Solubility in Water: Sparingly soluble			
Appearance and Order: White to off white powder, no odor			

Section IV – Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits:	LEL	UEL
Extinguishing Media: Water spray, Co2 Dry Chemical			
Special Fire Fighting Procedures:			

Section V – Reactivity Data

Stability	Unstable		Conditions to Avoid:
	Stable	X	

Incompatibility (Materials to Avoid)

Hazardous Polymerization	May Occur		Conditions to Avoid:
	Will Not Occur	X	

Section VI – Health Hazard Data

Route(s) of Entry:	Inhalation:	Skin:	Ingestion:
Health Hazards (Acute and Chronic): Prolonged Exposure may be irritating to the skin or eyes.			
Carcinogenicity:	NTP:	IASC Monographs:	OSHA Regulated:
Signs and symptoms of Exposure			
Medical Conditions Generally Aggravated by Exposure:			
Emergency and First Aid Procedures: Wash with soap and warm water.			
Eye Contact: Flush eyes with water fro 15 minutes.			

Section VII – Precautions for safe Handling and Use:

Steps to be taken in case Material Is Released or Spilled: Remove all sources of ignition, shovel into dry containers, then flush area with water.
Waste Disposal Method: For disposal please contact your local sewer and water authorities
Material may be incinerated or sent to authorized treatment storage disposal facility.
Precautions to be Taken in Handling And Storing:
Other Precautions:

Section VIII – Control Measures

Respiratory Protection (Specify Type) Dust Mask			
Ventilation	Local Exhaust: Yes	Special:	
	Mechanical:	Other:	
Protective Gloves: Rubber	Eye Protection: Safety Goggles		
Other Protective Clothing or Equipment: Apron			
Work/ Hygienic Practices: Wash hands, face and all equipment used and counter tops.			