

CATALOG NUMBER 01-0080 TO MAKE 10 LITERS

PHOTOGRAPHERS' FORMULARY

FORMULARY FX-1 HIGH ACUTANCE FILM DEVELOPER

Formulary FX-1, originally formulated by Geoffrey W. Crawley, editor of the British Journal of Photography, is designed to produce negatives with maximum acutance or sharpness. The negatives will have a long tonal scale and are exceptionally easy to print. The print impact is impressive and often seems to have an "engraving-like" effect because of the high acutance of the negative. To achieve these effects the formula is designed to have chemical mechanism which deliberately enhances edge contrast and provokes adjacency effects.

FX-1 produces negatives with slightly more grain than D-76 does. The grain is not very apparent because of the extreme details contained in the negative. Grain can be kept to a minimum by careful exposure and processing. FX-1 increases film speed by one F-stop. A superior negative can be obtained by using a slow film developed in FX-1 than can be obtained by developing a fast film in a fine grain developer.

A note of caution - developer FX-1 enhances both resolution and poor photographic techniques. Be sure to use a first class modern multicoated lens, high shutter speeds, a tripod, and accurate exposures.

CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warning label on each package.

Some individuals become sensitized (develop allergic symptoms or rashes) when using metol. If this should happen, discontinue use and see 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 THIRTY DAYS FOR A FULL REFUND.

MIXING THE STOCK SOLUTIONS

FOR BEST RESULTS USE DISTILLED WATER.

You will need two 1 liter bottles, one of which should be brown and a wide-mouth 1 liter container. Stock solution A should be made with water that has been boiled for 3 minutes then cooled to about 32° C/90° F, or distilled water heated to approximately 32° C/90° F.

STOCK SOLUTION A

Chemical	Amount
Distilled Water (32° C/90° F)	900 ml
Sodium sulfite, anhydrous	50 g
Metol	5 g
Potassium Iodide Solution	10 ml
Distilled water to make	1000 ml

Potassium Iodide Solution: The original formula published in the British Journal of Photography calls for 50 ml of a 0.001% solution of potassium iodide. When exactly 10 ml of the potassium iodide solution supplied with this kit is added to the stock solution, it will be the equivalent of adding the 50 ml of 0.001% solution. This 10 ml vial contains 0.0005 grams of potassium iodide in solution.

Before preparing the solution, either use distilled water or boil the water that you will need and allow it to cool to about 32° C/90° F. Boiling degasses the water and minimizes the initial oxidation of the metol.



THATCHER COMPANY MATERIAL SAFETY DATA SHEET
PRODUCT: SODIUM SULFITE, CATALYZED
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MSDS Date: December 2, 2003
Emergency Contact: 1-800-424-9300

SECTION I

PRODUCT NAME: Sodium Sulfite, Catalyzed
CHEMICAL NAME: Sodium Sulfite, catalyzed
CHEMICAL FAMILY: Inorganic Sulfite
SYNONYMS: B 501; Catalyzed Anhydrous Sodium Sulfite
FORMULA: Na_2SO_3 + catalyst

DOT SHIPPING INFORMATION: Not DOT Regulated

SECTION II - HAZARDOUS INGREDIENTS

This material contains no ingredients which are known by Thatcher Company to be hazardous unless listed below.

HAZARDOUS MATERIAL	CAS NUMBER	w/w %	EXPOSURE LIMITS IN AIR
Sodium Sulfite	7757-83-7		TLV = 5 mg/m ³ *
Cobalt Sulfate (as Co)	10124-43-3		TLV = 0.05 mg/m ³ * PEL = 0.1 mg/m ³

The specific identity of some ingredients may be withheld for confidential business purposes. However, all known potential health effects from exposure to these ingredients are being addressed. *recommended

SECTION III - PHYSICAL DATA

BOILING POINT (F): N/A

SPECIFIC GRAVITY: 2.633 @ 15.4 EC

VAPOR PRESSURE (mm Hg): N/A

% VOLATILE, BY VOLUME: N/A

VAPOR DENSITY (air = 1): N/A

EVAPORATION RATE: N/A

SOLUBILITY IN WATER: Soluble

APPEARANCE AND ODOR: White to pink crystals or powder with saline, sulfurous taste.

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT: Nonflammable

FLAMMABLE LIMITS:

Lel: N/A Uel: N/A

EXTINGUISHING MEDIA:



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Use any.

SPECIAL FIRE-FIGHTING PROCEDURES:

Wear self-contained breathing apparatus if necessary.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

When heated, catalyzed sodium sulfite decomposes and emits highly toxic fumes of sodium oxide and sulfur oxides.

SECTION V - REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS OR MATERIALS TO AVOID:

None.

HAZARDOUS DECOMPOSITION PRODUCTS:

When heated, catalyzed sodium sulfite decomposes and emits toxic fumes of sodium oxide and sulfur oxides.

SECTION VI - HEALTH HAZARD DATA

CARCINOGENIC LISTING:

NTP: No ingredients listed in this section.

IARC MONOGRAPHS: No ingredients listed in this section.

OSHA 29 CFR 1910: No ingredients listed in this section.

ENTRY ROUTES & EFFECTS OF OVEREXPOSURE:

Contact: Contact may irritate eyes.

Ingestion: If swallowed, can cause irritation of stomach, nausea and gas.

STATEMENT OF PRACTICAL TREATMENT:

Contact: Flush exposed area thoroughly with soap and water. For eyes, flush with cool water for at least 15 minutes. If irritation persists, get medical attention.

Ingestion: If swallowed, give several glasses of water and call a physician immediately.

SECTION VII - SPECIAL PRECAUTIONS



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HANDLING AND STORAGE PRECAUTIONS:

Store in a cool, dry area .

STEPS TO BE TAKEN IF MATERIAL SPILLS OR LEAKS:

Wear proper safety equipment. Sweep up material and put into drums. Flush residue to sewer with large amounts of water (if permitted).

WASTE DISPOSAL METHOD:

Dispose of in landfill. Comply with all local, state and federal regulations.

OTHER PRECAUTIONS:

N/A

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

Use dust mask as needed to avoid breathing dust.

VENTILATION:

Use adequate ventilation.

EYE PROTECTION:

Wear goggles or safety glasses.

SKIN PROTECTION:

Wear rubber gloves.

OTHER PROTECTIVE EQUIPMENT:

None required.

ACGIH = American Conference of Governmental Industrial Hygienists

CL = Ceiling Level

IARC = International Agency for Research on Cancer: Monographs

OSHA = Occupational Safety and Health Administration

N/A = Not Applicable

NTP = National Toxicology Program: Annual Report on Carcinogens

PEL = Permissible Exposure Level (OSHA)

TLV = Threshold Limit Value (ACGIH)

TWA = Time Weighted Average over 8 Hours

STEL = Short Term Exposure Limit (ACGIH)

ND = Not Determined

This information is, to the best of our knowledge, accurate but may not be complete. THATCHER COMPANY furnishes this information in good faith, but without warranty, representation or guarantee of its accuracy, completeness, or reliability.

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MATERIAL SAFETY DATA SHEET (M. S. D. S.)

SECTION – I, CHEMICAL IDENTIFICATION

NAME OF PRODUCT : METOL (p-METHYL AMINOPHENOL SULPHATE)
CHEMICAL FORMULA : $\text{HOC}_6\text{H}_4\text{NHCH}_3 \frac{1}{2} \text{H}_2\text{SO}_4$
CAS NO. : 55-55-0

SECTION – II, HAZARDS IDENTIFICATION

- TOXIC BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.
- IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
- IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).
- IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
- WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE PROTECTION.

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SECTION – III, FIRST-AID MEASURES

- IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
- IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.
- IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
- IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.
- WASH CONTAMINATED CLOTHING BEFORE REUSE.

SECTION – IV, FIRE FIGHTING MEASURES

- EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
- SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
- UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

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SECTION – V, ACCIDENTAL RELEASE MEASURES

- WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
- SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
- VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION – VI, SAFE HANDLING / PERSONAL PROTECTION

- WEAR APPROPRIATE RESPIRATOR, CHEMICAL-RESISTANT GLOVES, SAFETY GOGGLES.
- SAFETY SHOWER AND EYE BATH.
- USE ONLY IN A CHEMICAL FUME HOOD.
- DO NOT BREATHE DUST.
- AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
- AVOID PROLONGED OR REPEATED EXPOSURE.
- WASH THOROUGHLY AFTER HANDLING.
- TOXIC.
- IRRITANT.
- POSSIBLE SENSITIZER.
- KEEP TIGHTLY CLOSED.
- PROTECT FROM LIGHT.

SECTION – VII, PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR	:	WHITE CRYSTALS, ODORLESS
PHYSICAL PROPERTIES		
MELTING POINT	:	260 ⁰ C (DEC)
AUTOIGNITION TEMPERATURE	:	531 ⁰ C

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SECTION -VIII, STABILITY AND REACTIVITY

- INCOMPATIBILITIES
 - ACIDS
 - ACIDS CHLORIDES
 - ACID ANHYDRIDES
 - OXIDIZING AGENTS
 - SENSITIVE TO LIGHT

- HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS

THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE, AND NITROGEN OXIDES.
SULFUR OXIDES.

SECTION -IX, TOXICOLOGICAL INFORMATION

ACUTE EFFECTS

- HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN.
- CAUSES EYE AND SKIN IRRITATION.
- MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
- PROLONGED OR REPEATED EXPOSURE MAY CAUSE ALLERGIC REACTIONS IN CERTAIN SENSITIVE INDIVIDUALS.
- TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

SECTION -X, OTHER INFORMATION

The information submitted is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processor from the responsibility of carrying out their own tests and experiments, neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.

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Please Note
Our New Area Code
631

DATE ISSUED 2/2/02

MATERIAL SAFETY DATA SHEET

IDENTIFICATION

PRODUCT NAME: POTASSIUM IODIDE
CHEMICAL FAMILY: INORGANIC SALT
CHEMICAL FORMULA: KI
CAS NUMBER: 7681-11-0
CHEMICAL NAME: SEE PRODUCT NAME
CARCINOGEN LIST STATUS: X NOT LISTED LISTED
 OSHA EPA NTP IARC
HAZARD MATERIAL DESCRIPTION: NONE
PROPER SHIPPING NAME: DOT-N.R.

HAZARD ID NUMBER: NONE

PHYSICAL DATA

BOILING POINT: 1330°C
VAPOR DENSITY: 5.7
% VOLATILE: N.D.A.
SPECIFIC GRAVITY: 3.1
pH: (aq) 7-9
APPEARANCE: SOLID

VAPOR PRESSURE: 1mm Hg @ 745°C
EVAPORATION RATE: N.D.A.
SOLUBILITY IN H₂O: SOLUBLE
% SOLID BY WEIGHT: N.A.
MELTING POINT: 686°C

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N.A.
FLAMMABLE LIMITS: LEL N.A. UEL
SPECIAL FIRE FIGHTING PROCEDURES: WEAR SCBA AND PROTECTIVE GEAR
EXTINGUISHING MEDIA: WATER X FOAM X CO₂ X DRY CHEMICAL X OTHER
UNUSUAL FIRE AND EXPLOSION HAZARDS:
MAY EMIT VERY TOXIC FUMES OF K₂O & I⁻ IF HEATED TO DECOMPOSITION.

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: NOT ESTABLISHED
PERMISSIBLE EXPOSURE LIMIT: NOT ESTABLISHED

<u>TOXICITY DATA</u>	<u>IRRITATION DATA</u>	<u>OTHER DATA</u>
ORAL-RAT LD ₅₀ = N.D.A.	EYE RABBIT= N.D.A.	MUTATION DATA
INHALATION RAT LD ₅₀ =	SKIN RABBIT=	REPRODUCTIVE EFFECTS STUDIES
SKIN RABBIT=		RTECS TT2975000 1985-86
INHALATION HUMAN=		

EFFECTS OF OVEREXPOSURE - CONDITIONS TO AVOID: UNKNOWN EYE IRRITANT X
EYE BURNS CANCER SUSPECT
X SKIN EFFECTS: SKIN IRRITANT X CORROSIVE HARMFUL IF ABSORBED THROUGH SKIN
 POISONOUS SYSTEMIC TOXIC EFFECTS
X INHALATION: VAPOR HARMFUL POISONOUS VAPOR NARCOTIC EFFECTS
 IRRITATING VAPOR X SYSTEMIC TOXIC EFFECTS

HEALTH HAZARD DATA (CONTINUED)

X INGESTION: HARMFUL IF SWALLOWED X POISON _____ SYSTEMIC TOXIC EFFECT _____
MAY CAUSE DISCOMFORT _____
X OTHER EFFECTS: A HUMAN & EXPERIMENTAL TERATOGEN & AN EXPERIMENTAL REPRODUCTIVE TOXIN:
SEE ABOVE:
TARGET ORGANS: SKIN X EYES X KIDNEYS _____ LIVER _____ BLOOD _____ LUNGS _____ OTHER X
FIRST AID: X EYES: flush with water for 15 minutes. X SKIN: remove contaminated
clothing and wash with soap and water. X INHALATION: remove from exposure
assist breathing. X INGESTION: GIVE WATER. INDUCE VOMITING. GET MEDICAL AID
Seek physician for all overexposures.
PRIMARY ROUTES OF ENTRY: INHALATION _____ SKIN CONTACT X OTHER X
HAZARDOUS INGREDIENTS: N.A.

REACTIVITY DATA

STABILITY: STABLE X UNSTABLE _____
CONDITIONS TO AVOID: HIGH TEMPERATURE _____
HAZARDOUS DECOMPOSITION PRODUCTS: K_2O , I^-
HAZARDOUS POLYMERIZATION: MAY OCCUR _____ WILL NOT OCCUR X
CONDITIONS TO AVOID: _____
INCOMPATIBLE MATERIALS: OXIDIZERS, BF_3 , ClF_3 , $FCIO_4$

SPILL OF LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
COLLECT SPILL AND PLACE IN A PROPER CONTAINER FOR DISPOSAL. VENTILATE WELL AND
SCRUB SPILL AREA WITH DETERGENT AND WATER SOLUTION.

WASTE DISPOSAL METHOD: DISPOSE FOLLOWING LOCAL, STATE, AND FEDERAL REGULATIONS.

SPECIAL PROTECTION INFORMATION

NIOSH APPROVED INORGANIC
RESPIRATORY PROTECTION: DUST MASK
VENTILATION: LOCAL EXHAUST
PROTECTIVE GLOVES: CHEMICAL RESISTANT
EYE PROTECTION: SAFETY GOGGLES
OTHER PROTECTIVE EQUIPMENT:
EYE WASH, LAB COAT OR WORK APRON

SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
STORE IN CLOSED CONTAINERS IN A COOL, DRY AREA. AVOID CONTACT WITH SKIN AND EYES OR
BREATHING DUST. WASH THOROUGHLY AFTER HANDLING.

NAME: JAMES A. BELL
SIGNATURE: James A. Bell
TITLE: DIRECTOR OF REGULATORY AFFAIRS
DATE: SEPTEMBER 12, 1994

N.D.A. - NO DATA AVAILABLE
N.A. - NOT APPLICABLE