

The Arts & Humanities Photography Studio

Ernest G. Welch School of Art & Design
College of the Arts
Georgia State University

Safety Handbook

All students, faculty and visitors are required to have read, be aware of, and abide by the rules and regulations contained herein.

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STUDIO/UNIVERSITY POLICY

PURPOSE FOR THIS GUIDE

The policies below are specific to the Photography area and pertain to all Photography faculty, staff and students. Though you may be taking classes in a studio/shop in one area of the building, be mindful of appropriate behavior and precautions for the entire Photography Department, as you may be exposed to any materials being used by others as well. The Photography studio is small and has limited resources, therefore the treatment of the facilities and equipment is very important. The following policies adhere to safety and environmental regulations, but specifics are based on observations of how the studio best operates day to day.

EMERGENCY PROCEDURES

EMERGENCY PROCEDURES

FOR ANY LIFE THREATENING EMERGENCY ()** – SEEK TREATMENT IMMEDIATELY

()**LIFE THREATENING*EMERGENCY* Could possibly include, but not limited to: portable damage to major blood vessels or nerves, profuse bleeding that cannot be stopped, amputated body part, broken bone, cut to bone, eye injury, head trauma and/or automobile accident.

IN CASE OF SERIOUS ACCIDENT or SECURITY EMERGENCY:

- Call GSU Public Safety at **404-413-3333** then call **911** for Atlanta City Police or paramedic.
- Immediately notify instructor (Photography area coordinator, or art office (room 117)).

NON-EMERGENCY PROCEDURES

Situations that do not require emergency or immediate attention should be reported to your instructor and/or the Area Coordinator.

Students who are injured at Georgia State University:

Students should go directly to the Student Health Center located in the University Commons at 141 Piedmont Avenue, Suite D. **WITH THE HEALTH CENTER AND SEE WHAT THEY RECOMMEND FOR STUDENTS AFTER HOURS**

Faculty & Staff who are injured while working for Georgia State University:

Injured employees, and their supervisors, must follow the current Workers' Compensation Protocols if they wish the Workers' Compensation Insurance to cover their medical expenses for their injury.

RESPONSIBILITY FOR SAFETY

FACULTY

Faculty are responsible for ensuring that students attend training and work safely and:

1. Ensure artists understand the potential health and physical hazards of the chemicals and equipment used;
2. Explain proper and safe procedures for handling, under all circumstances, the hazardous substances used;
3. Provide appropriate equipment to allow laboratory workers to work safely

ARTISTS

Each student, faculty and staff member is expected to attend training and:

1. Follow procedures and practices outlined in this training guide
2. Report all accidents, near misses, and potential chemical exposures to the area coordinator

SECURITY – GSU CAMPUS POLICE: 404-413-2100

CAMPUS POLICE

- Call the police if there is any strange activity or disturbance. Call 404-413-2100 or 3-2100
- Escort service is also available from the Arts & Humanities Building to any Atlanta GSU Building, parked cars, and public transportation. **After hours campus security safety escorts are available by calling 404-413-2100**
- Studio doors should be kept locked at all times.
- After shutting, check to see if the doors are truly locked.

*****When working in the studio after hours, students are encouraged to notify the campus police and to utilize the escort service.**

ACCESS TO THE PHOTOGRAPHY DEPARTMENT

CARD ACCESS

All students who are registered for photography classes are given clearance for 24 hr. Panther Card access to the front door of the Art and Humanities Building. If your card does not work two weeks after turning in your After Hours Pass to your course instructor, go to the **Art Office (AH 117)**, to activate the card. Have your After Hours Pass with signatures from your course instructor and School Director with you. Sometimes it is necessary to go back several times.

Do not allow anyone into the building from the outside who may not have access. If the building is locked and accessible only with a campus I.D., be careful not to let anyone follow you into the building.

HOURS

The Art and Humanities Building is normally open M-F from 7:30 AM to 7:30 PM during the regular school year.

STUDIO USE

Students are permitted and often required to work outside of class in the photography Studios. Note the posted schedule of photography classes. You may not work independently in a shop while another class is being held unless you ask the permission of the instructor conducting the class beforehand.

SAFETY IN NUMBERS

The Art and Humanities Building does not have a guard. It is recommended that you always work with a partner when working outside of scheduled class hours for both personal safety and in case of an accident.

CLASSROOM/STUDIO DOORS

The DOOR CODES may not be given to anyone, even fellow GSU students- If anyone has unauthorized access to the code, it will be changed immediately. The code is changed every semester and the area coordinator can change it whenever necessary and restrict access. Do not compromise the security of yourself and others in the Art and Humanities Building or the Photography Studios: Do not leave doors propped open at any time, either for friends, for a quick trip to the store, or because your card does not work!

COMBINATIONS

Push button combinations to the doors to the photography studio are given out to students of the relevant classes by instructors. Do not give out these combinations to anyone except photography classmates.

ACCESS FOR THOSE NOT ENROLLED IN CLASSES

Students currently not enrolled in classes who wish to use the photography facilities may do so only with the permission of the Photography Area Coordinator. Prior experience with a photography class is normally a prerequisite.

STUDIO ETIQUETTE**SMOKING**

NO SMOKING AT ANY TIME. Smoking is NOT ALLOWED ANYWHERE IN THE STUDIO, OR WITHIN 25 FEET OF ANY GSU BUILDING.

FOOD AND BEVERAGES

No Food or beverages are allowed in the Photography studio

SHOWS & GRANTS

Students are encouraged to post and note shows, as well as, grant opportunities on the bulletin boards between the Arts & Humanities Elevators.

SPACE ALLOCATION

GRADUATE STUDENTS will be assigned space in the graduate room. These **spaces are determined by the faculty and are non-negotiable**. Graduate students will be offered space for **three** contiguous years only. After that time if the student is still in the program, he/she will be required to vacate that space and must provide their own workspace off campus.

The graduate space is reserved for graduate students only. No other students are permitted entry into this space.

SUPPLIES, MATERIALS & MAINTENANCE

Every Photography course has an associated fee that provides for purchase of common supplies and studio maintenance. Course fees are paid along with tuition and fee amounts are available in the course catalog. While these fees are sufficient to support most student work in the studio, certain projects may require the student to purchase additional supplies at their own expense. "Excessive use" of common studio supplies and resources is determined by the faculty.

MATERIALS FOR STUDENT PROJECTS

Aside from certain projects in beginning courses, students must supply their own materials for projects. In many cases the department has access to or can help find materials.

Do not use any materials found in the studio or classrooms without permission of the owner or an instructor.

If you did not pay for a particular material or bring it in yourself, then it belongs to Someone Else! **DO NOT USE IT.**

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) is special gear used to protect the wearer from specific hazards of a hazardous substance. It is a last resort protection system, to be used when substitution or engineering controls are not feasible. It should be understood that PPE does not reduce or eliminate the hazard. It only protects the wearer and does nothing for anybody else in the area or for any equipment exposed to the chemical.

PPE includes gloves, respiratory protection, eye protection, and protective clothing. The need for PPE is dependent upon the type of operations and the nature and quantity of the materials in use, and must be assessed on a case by case basis. Workers who rely on PPE must understand the function, proper use, and

limitations of the PPE used.

GLOVE SELECTION AND USE

Gloves should be worn whenever the possibility of skin contact with hazardous chemicals exists. Every glove is permeable to a chemical. The permeability varies with the chemical being used, the length of time of the exposure and the thickness of the glove. General use gloves, such as the latex surgical gloves, are appropriate when using small amounts of most chemicals for short periods of time. These gloves should be changed whenever they become contaminated with the chemical. Otherwise, the glove that offers the best resistance to the chemical should be used. The following guidelines should be used to determine the appropriate glove.

1. Review the Material Safety Data Sheet (MSDS) for the chemical of interest.
2. Determine the potential consequences of skin contact by the chemical.
3. Determine the exposure period and characteristic of the potential contact. That is, are you choosing gloves to protect you from an occasional splash or spill or are you planning to wear the gloves while you immerse your entire hand and arm in a container of material.
4. Determine which gloves or glove materials offer the best resistance to the chemical. This information may be found in the Personal Protective Equipment section of the MSDS, glove vendor information or the Chemical Protective Clothing database available through Georgia State.
5. Establish the dexterity and sizing requirements.
6. Determine physical resistance properties required of the glove. That is, resistance to heat, cutting, punctures, etc.
7. Other considerations - color, cuffs, length of glove, use of liners.
8. Establish a decontamination procedure. Be sure to check for pinholes before use, wash or decontaminate gloves before removing, and wash hands after removing.

In addition to protecting hands and skin from chemical exposures, there are many gloves which offer protection from physical hazards, such as high or low temperatures, electrical shock, skin abrasions, vibration or sharp objects. Always match the glove to the hazard.

RESPIRATORY PROTECTION

A respirator may only be used when engineering controls, such as general ventilation or a fume hood, are not feasible or do not reduce the exposure of a chemical to acceptable levels. The use of a respirator is subject to prior review by

Georgia State Research and Health Safety Officer at 404- 413- 3510, according to university policy, since their use is regulated by the OSHA respiratory protection standard.

Any worker who believes that respiratory protection is needed must notify Georgia State for evaluation of the hazard and enrollment in the Respiratory Protection Program. This program involves procedures for respirator selection, medical assessment of employee health, employee training, proper fitting, respirator inspection, maintenance, and record keeping.

EYE PROTECTION

Safety glasses should be worn for protection from impact of particles. Standard eyeglasses fitted with side shields are generally not sufficient. Workers who are interested in prescription safety glasses should contact Georgia State Environmental Programs Advisory Committee at (404) 413-3500. Goggles should be worn when a potential splash from a hazardous material exists. They may be worn over prescription glasses. Face shields are in order when working with large volumes of hazardous materials, either for protection from splash to the eye or flying particles. Face shields may be used in conjunction with goggles for maximum protection from corrosives and hot chemicals. Contact lenses do not offer any protection from chemical contact.

PROTECTIVE CLOTHING

When the possibility of chemical contamination exists, protective clothing, which resists physical and chemical hazards, should be worn over street clothes. Smocks are appropriate for minor chemical splashes and spills, while plastic or rubber aprons are best for protection from corrosive or irritating liquids.

Loose clothing (such as overlarge smocks or ties), skimpy clothing (such as shorts), torn clothing and unrestrained hair may pose a hazard. Perforated shoes, sandals, or cloth sneakers should not be worn in chemical use areas or where mechanical work is being performed.

EXPLANATION OF MATERIAL SAFETY DATA SHEET

Per the OSHA Hazard Communication Standard, School of Art and Design is required to ensure that material safety data sheets are readily available for all chemicals used in the department. Material Safety Data Sheets (MSDSs) are available upon request. Individuals who bring in materials from outside must keep MSDSs on hand. New materials must be approved for use and storage by the Department Manager or Technical Manager and MSDSs must be included in the MSDS binder.

Following is an explanation which is provided to help you interpret the information found on manufacturers' MSDSs. While the format of these data sheets varies from manufacturer to manufacturer, certain components appear on each sheet.

SPILL WORK PRACTICES

In the event of a chemical spill, the individual(s) who caused the spill is responsible for prompt and proper clean-up. It is also their responsibility to have spill control equipment appropriate for the chemicals being handled readily available. There should be a sufficient quantity of absorbents or other types of materials to control any spill that can be reasonably anticipated. Vermiculite, lined 5-gallon pails and limited spill control materials are available throughout the building.

CHEMICAL EXPOSURE

The following procedures should be followed in the event of chemical exposure. In all cases, the incident should be reported to the area coordinator, regardless of severity.

CHEMICALS ON SKIN

1. Immediately flush with water for no less than fifteen minutes. Remove any jewelry or clothing that have become contaminated to facilitate removal of any residual material. For pullover shirts and sweaters, it may be beneficial to cut garments off to prevent contamination of eyes.
2. If immediate medical attention is needed, call Public Safety at 404-413-3333 for an ambulance or transportation to Hospital.
3. Explain carefully what chemicals were involved.
4. Review the MSDS to determine if any delayed effects should be expected.

CHEMICALS IN EYES

1. Flush eye(s) with water for at least fifteen minutes. The eyes must be forcibly held open to wash, and the eyeballs must be rotated so all surface area is rinsed. The use of an eye wash fountain is desirable so hands are free to hold the eyes open.
2. Remove contact lenses while rinsing. Do not attempt to rinse and reinsert contact lenses.
3. Seek medical attention regardless of the severity or apparent lack of severity. Contact GSU Police at 404-413-3333. Explain carefully what chemicals were involved.
4. Review the MSDS to determine if any delayed effects are expected.

CHEMICAL INHALATION

1. Close containers, open windows or otherwise increase ventilation, and move to fresh air.
2. If symptoms, such as headaches, nose or throat irritation, dizziness, or drowsiness persist, seek medical attention by calling GSU Police at 404-413-3333. Explain carefully what chemicals were involved.
3. Review the MSDS to determine what health effects are expected, including delayed effects.

ACCIDENTAL INJECTION OF CHEMICAL

1. Immediately contact the Poison Control Center at 800-962-1253 for instructions.
2. Do not induce vomiting unless directed to do so by a health care provider. Explain carefully what chemicals were involved.
3. Review the MSDS to determine what health effects are expected, including delayed effects.

WASTE DISPOSAL

HAZARDOUS CHEMICAL WASTE PICK-UP PROCEDURES

The following procedure refers to hazardous chemical waste only (not biological/medical waste).

Keep your hazardous waste containers clean, in good condition, and make sure they are securely closed at all times.

1. Store your hazardous waste containers in secondary containment such as trays to minimize opportunities for a spill.
2. Make sure your hazardous waste containers are labeled with a yellow hazardous waste sticker that details the contents using full chemical names (no abbreviations) and percentages, or using a GSU waste stream name.
3. When your hazardous waste containers are full, create a Pickup Worksheet at <https://chematix.gsu.edu/Chematix/> and submit your request through Chematix. You may also e-mail eprograms@gsu.edu
4. If you require replacement supplies indicate this on your online Environmental Work Request.
5. If you require supplies at any time, without a waste pick-up e-mail eprograms@gsu.edu
6. A list of supplies is available for review online at http://www.gsu.edu/research/lab_safety_supplies.html
7. Allow 72 hours for the waste pick-up or supply delivery.

For questions or concerns contact the Environmental Program Manager: 3-3551, or a Chemical Safety Specialist: 3-3535 or 3-3568

HANDELING HAZARDOUS WASTE

Materials that are to be disposed of as hazardous waste must be placed in sealable containers. Containers should be filled, leaving a headspace for expansion of the contents. Often the original container is perfectly acceptable. If you routinely generate significant quantities of compatible solvents, bulking of waste in five-gallon carboys provided by GSU EPA may be practical.

Similar wastes may be mixed if they are compatible (e.g. solvents, linseed oil and oil-based paint). Containers must be kept closed except during actual transfers. Do not leave a hazardous waste container with a funnel in it hazardous waste label.

Waste containers must be labeled as hazardous waste as soon as the material is first put into the container. Waste container labels are available on each flammable liquid storage cabinet and through the sculpture shop. Be sure to include the name and phone number of a person that can be reached on the day of the waste pickup.

Procedure:

1. Place the waste materials in an appropriate waste container.
2. Seal the container. Do not leave a funnel in an open container.
3. Ensure the container has a completed hazardous waste sticker on it. If there is no room for a sticker, or if a sticker is not immediately available, write the words "Hazardous Waste" on the container and ensure that the contents are clear.
4. Once the container is full, inform the ceramics area to ensure that it is included with the next scheduled waste pickup.

Chemical waste pickups are generally scheduled as needed. Please notify the Graduate Lab Assistant or your faculty member if you notice to fill a container.

PARTICULARLY HAZARDOUS SUBSTANCES

WHERE TO FIND TOXICITY INFORMATION

Toxicity information may be found in Material Safety Data Sheets, under the "Health Hazard Data" section, on product labels, in the Registry of Toxic Effects of Chemical Substances (RTECS), or in many other sources listed in the Health and Safety Reference Guide on the next page.

ACID SAFETY GUIDELINES

Several different acids at varying concentrations are used in the photography

department. All are corrosive and must be used with caution and at locations with local ventilation. Before using acids, review all precautions and emergency procedures.

The GSU Health Clinic phone number is 404-413-1930

The Georgia Poison Center 24 hr. hotline number is 1-800-222-1222 or 404-616-9000

ACID SPLASH IN EYES:

Flush at eye wash station for 15 minutes, then see a doctor.

ACID CONTACT WITH SKIN:

Remove any contaminated clothing. Rinse thoroughly with running water. Apply sodium bicarbonate (baking soda) directly to affected area. For severe spills, use emergency shower in intaglio room and get medical advice.

ACID SPILLS:

Authorized personnel only: Neutralize with sodium bicarbonate (baking soda). Wear gloves and mop up with spill kit materials or newspapers and paper towels, then thoroughly rinse with water.

1. Dispose of materials properly in plastic bag.
2. **Wear approved gloves*, apron, goggles, and/or a face shield** when handling any pure acids. **AVOID SKIN CONTACT, EVEN WHEN HANDLING DILUTED ACIDS.**
3. Locate the eye wash and emergency shower before working with any corrosives. (* Gloves make handling drop bottles in litho difficult, so do not wear gloves in that case.)
4. **“Do as you otter, add acid to water.”** Always pour acid into water or gum arabic, never the reverse. Pouring water into acid may cause a violent heat-producing reaction.
5. **Avoid breathing acid vapors.** Acute burns to your respiratory system can occur.
6. Though the acid room is equipped with good local ventilation, for prolonged use of the acid room, you may want to wear a respirator with appropriate acid-absorbing cartridges. When using small solutions of concentrated acids such as for “spit biting,” set up at a local ventilation source, such as in spray booth or at litho processing counter, wear safety glasses and use a respirator with appropriate cartridges.
7. **Close lids on acid baths when not in use** to preserve strength and reduce vapors and/or mists.
8. **Do not lean directly over acid baths! Avoid breathing vapors!**
9. **Be extra careful with splashes or spills when putting plates into the acid baths.** If splashes occur on clothing or skin, immediately wash with running water.
10. **Use white plastic spatulas** to assist in removing plates from acid baths. Allow acid to drain from plate over acid bath. Thoroughly rinse plate with

cold running water in sink. Do not use metal spatulas in acid baths!

11. **Only the Printmaking area coordinator or trained shop tech is to change or modify acid baths.** Acid solutions are changed once every two weeks. However, their strengths can weaken depending on use. Ask the shop tech to change acid baths if baths seem weak. Do not attempt to mix or spite the plate etching mordant; only staff or faculty may do this.
12. **Do not use white ground in these acid baths!** Consult with the shop tech in order to set up special bath.

BLACK-AND-WHITE PHOTOGRAPHIC PROCESSING

A wide variety of chemicals are used in black and white photographic processing. Film developing is usually done in closed canisters. Print processing uses tray processing, with successive developing baths, stop baths, fixing baths, and rinse steps. Other treatments include use of hardeners, intensifiers, reducers, toners, and hypo eliminators.

MIXING PHOTOCHEMICALS

Photochemicals can be bought in liquid form, which only need diluting, or powder form, which need dissolving and diluting.

Hazards

1. Developer solutions and powders are often highly alkaline, and glacial acetic acid, used in making the stop bath, is also corrosive by skin contact, inhalation and ingestion.
2. Developer powders are highly toxic by inhalation, and moderately toxic by skin contact, due to the alkali and developers themselves.

Precautions

1. Use liquid chemistry whenever possible, rather than mixing developing powders. Pregnant women, in particular, should not be exposed to powdered developer.
2. When mixing powdered developers, use a glove box (a cardboard box with glass or plexiglas top, and two holes in the sides for hands and arms), local exhaust ventilation, or wear a NIOSH-approved toxic dust respirator.
3. Wear gloves, goggles and protective apron when mixing concentrated photochemicals. Always add any acid to water, never the reverse.
4. In case of skin contact, rinse with lots of water. In case of eye contact, rinse for at least 15-20 minutes, preferably using an eyewash station, seek medical attention.
5. Store concentrated acids and other corrosive chemicals on low shelves so as to reduce the chance of face or eye damage in case of breakage and splashing.
6. Do not store photographic solutions in glass containers.

DEVELOPING BATHS

The most commonly used developers are hydroquinone, monomethyl para-amino phenol sulfate, and phenidone. Several other developers are used for special purposes. Other common components of developing baths include an accelerator, often sodium

carbonate or borax, sodium sulfite as a preservative, and potassium bromide as a restrainer or antifogging agent.

Hazards

1. Developers are skin and eye irritants, and in many cases strong sensitizers. Monomethyl-p-aminophenol sulfate creates many skin problems, and allergies to it are frequent (although this is thought to be due to the presence of para-phenylene diamine as a contaminant). Hydroquinone can cause depigmentation and eye injury after five or more years of repeated exposure, and is a mutagen. Some developers also can be absorbed through the skin to cause severe poisoning (e.g., catechol, pyrogalllic acid). Phenidone is only slightly toxic by skin contact.
2. Most developers are moderately to highly toxic by ingestion, with ingestion of less than one tablespoon of compounds such as monomethyl-p-aminophenol sulfate, hydroquinone, or pyrocatechol being possibly fatal for adults. Symptoms include ringing in the ears (tinnitus), nausea, dizziness, muscular twitching, increased respiration, headache, cyanosis (turning blue from lack of oxygen) due to methemoglobinemia, delirium, and coma. With some developers, convulsions also can occur.
3. Para-phenylene diamine and some of its derivatives are highly toxic by skin contact, inhalation, and ingestion. They cause very severe skin allergies and can be absorbed through the skin.
4. Sodium hydroxide, sodium carbonate, and other alkalis used as accelerators are highly corrosive by skin contact or ingestion. This is a particular problem with the pure alkali or with concentrated stock solutions.
5. Potassium bromide is moderately toxic by inhalation or ingestion and slightly toxic by skin contact. Symptoms of systemic poisoning include somnolence, depression, lack of coordination, mental confusion, hallucinations, and skin rashes.
6. Sodium sulfite is moderately toxic by ingestion or inhalation, causing gastric upset, colic, diarrhea, circulatory problems, and central nervous system depression. It is not appreciably toxic by skin contact. If heated or allowed to stand for a long time in water or acid, it decomposes to produce sulfur dioxide, which is highly irritating by inhalation.

Precautions

1. See the section on Mixing Photochemicals for mixing precautions.
2. Do not put your bare hands in developer baths. Use tongs instead. If developer solution splashes on your skin or eyes immediately rinse with lots of water. For eye splashes, continue rinsing for 15-20 minutes and seek medical attention.
3. Do not use para-phenylene diamine or its derivatives if at all possible.

STOP BATHS AND FIXER

Stop baths are usually weak solutions of acetic acid. Acetic acid is commonly available as pure glacial acetic acid or 28% acetic acid. Some stop baths contain potassium chrome alum as a hardener.

Fixing baths contain sodium thiosulfate ("hypo") as the fixing agent, and sodium sulfite and sodium bisulfite as a preservative. Fixing baths also may also contain alum (potassium aluminum sulfate) as a hardener and boric acid as a buffer.

Hazards

1. Acetic acid, in concentrated solutions, is highly toxic by inhalation, skin contact, and ingestion. It can cause dermatitis and ulcers, and can strongly irritate the mucous membranes. The final stop bath is only slightly hazardous by skin contact. Continual inhalation of acetic acid vapors, even from the stop bath, may cause chronic bronchitis.
2. Potassium chrome alum or chrome alum (potassium chromium sulfate) is moderately toxic by skin contact and inhalation, causing dermatitis and allergies.
3. In powder form, sodium thiosulfate is not significantly toxic by skin contact. By ingestion it has a purging effect on the bowels. Upon heating or long standing in solution, it can decompose to form highly toxic sulfur dioxide, which can cause chronic lung problems.
4. Many asthmatics are particularly sensitive to sulfur dioxide.
5. Sodium bisulfite decomposes to form sulfur dioxide if the fixing bath contains boric acid, or if acetic acid is transferred to the fixing bath on the surface of the print.
6. Alum (potassium aluminum sulfate) is only slightly toxic. It may cause skin allergies or irritation.
7. Boric acid is moderately toxic by ingestion or inhalation and slightly toxic by skin contact (unless the skin is abraded or burned, in which case it can be highly toxic).

Precautions

1. All darkrooms require good ventilation to control the level of acetic acid vapors and sulfur dioxide gas produced in photography.
2. Wear gloves and goggles.
3. Cover all baths when not in use to prevent evaporation or release of toxic vapors and gases.

INTENSIFIERS AND REDUCERS

A common after-treatment of negatives (and occasionally prints) is either intensification or reduction. Common intensifiers include hydrochloric acid and potassium dichromate, or potassium chlorochromate. Mercuric chloride followed by ammonia or sodium sulfite, Monckhoven's intensifier consisting of a mercuric salt bleach followed by a silver nitrate/potassium cyanide solution, mercuric iodide/sodium sulfite, and uranium nitrate are older, now discarded, intensifiers.

Reduction of negatives is usually done with Farmer's reducer, consisting of potassium ferricyanide and hypo. Reduction has also been done historically with iodine/potassium cyanide, ammonium persulfate, and potassium permanganate/sulfuric acid.

Hazards

1. Potassium dichromate and potassium chlorochromate are probable human carcinogens, and can cause skin allergies and ulceration. Potassium chlorochromate can release highly toxic chlorine gas if heated or if acid is added.
2. Concentrated hydrochloric acid is corrosive; the diluted acid is a skin and eye irritant.
3. Mercury compounds are moderately toxic by skin contact and may be absorbed through the skin. They are also highly toxic by inhalation and extremely toxic by ingestion. Uranium intensifiers are radioactive, and are especially hazardous to the kidneys.
4. Sodium or potassium cyanide is extremely toxic by inhalation and ingestion, and moderately toxic by skin contact. Adding acid to cyanide forms extremely toxic hydrogen cyanide gas which can be rapidly fatal.
5. Potassium ferricyanide, although only slightly toxic by itself, will release hydrogen cyanide gas if heated, if hot acid is added, or if exposed to strong ultraviolet light (e.g., carbon arcs). Cases of cyanide poisoning have occurred through treating Farmer's reducer with acid.
6. Potassium permanganate and ammonium persulfate are strong oxidizers and may cause fires or explosions in contact with solvents and other organic materials.

Precautions

1. Chromium intensifiers are probably the least toxic intensifiers, even though they are probable human carcinogens. Gloves and goggles should be worn when preparing and using these intensifiers. Mix the powders in a glove box or wear a NIOSH-approved toxic dust respirator. Do not expose potassium chlorochromate to acid or heat.
2. Do not use mercury, cyanide or uranium intensifiers, or cyanide reducers because of their high or extreme toxicity.
3. The safest reducer to use is Farmer's reducer. Do not expose Farmer's reducer to acid, ultraviolet light, or heat.

TONERS

Toning a print usually involves replacement of silver by another metal, for example, gold, selenium, uranium, platinum, or iron. In some cases, the toning involves replacement of silver metal by brown silver sulfide, for example, in the various types of sulfide toners. A variety of other chemicals are also used in the toning solutions.

Hazards

1. Sulfides release highly toxic hydrogen sulfide gas during toning, or when treated with acid.
2. Selenium is a skin and eye irritant and can cause kidney damage. Treatment of selenium salts with acid may release highly toxic hydrogen selenide gas. Selenium toners also give off large amounts of sulfur dioxide gas.
3. Gold and platinum salts are strong sensitizers and can produce allergic skin reactions and asthma, particularly in fair-haired people.
4. Thiourea is a probable human carcinogen since it causes cancer in animals.

Precautions

1. Carry out normal precautions for handling toxic chemicals as described in previous sections. In particular, wear gloves and goggles. See also the section on [mixing photochemicals](#).
2. Toning solutions must be used with local exhaust ventilation.
3. Take precautions to make sure that sulfide or selenium toners are not contaminated with acids. For example, with two bath sulfide toners, make sure you rinse the print well after bleaching in acid solution before dipping it in the sulfide developer.
4. Avoid thiourea whenever possible because of its probable cancer status.

OTHER HAZARDS

Many other chemicals are also used in black and white processing, including formaldehyde as a pre-hardener, a variety of oxidizing agents as hypo eliminators (e.g., hydrogen peroxide and ammonia, potassium permanganate, bleaches, and potassium persulfate), sodium sulfide to test for residual silver, silver nitrate to test for residual hypo, solvents such as methyl chloroform and freons for film and print cleaning, and concentrated acids to clean trays.

Electrical outlets and equipment can present electrical hazards in darkrooms due to the risk of splashing water.

Hazards

1. Concentrated sulfuric acid, mixed with potassium permanganate or potassium dichromate, produces highly corrosive permanganic and chromic acids.
2. Hypochlorite bleaches can release highly toxic chlorine gas when acid is added, or if heated.
3. Potassium persulfate and other oxidizing agents used as hypo eliminators may cause fires when in contact with easily oxidizable materials, such as many solvents and other combustible materials. Most are also skin and eye irritants.

Precautions

1. See previous sections for precautions in handling photographic chemicals.
2. Cleaning acids should be handled with great care. Wear gloves, goggles and acid-proof, protective apron. Always add acid to the water when diluting.
3. Do not add acid to, or heat, hypochlorite bleaches.
4. Keep potassium persulfate and other strong oxidizing agents separate from flammable and easily oxidizable substances.
5. Install ground fault interrupters (GFCIs) whenever electrical outlets or electrical equipment (e.g. enlargers) are within six feet of the risk of water splashes.

COLOR PROCESSING

Color processing is much more complicated than black and white processing, and there is a wide variation in processes used by different companies. Color processing can be either done in trays or in automatic processors.

COLOR DEVELOPING BATHS

The first developer of color transparency processing usually contains monomethyl-p-aminophenol sulfate, hydroquinone, and other normal black and white developer components. Color developers contain a wide variety of chemicals including color coupling agents, penetrating solvents (such as benzyl alcohol, ethylene glycol, and ethoxydiglycol), amines, and others.

Hazards

1. See the developing section of black and white processing for the hazards of standard black and white developers.
2. In general, color developers are more hazardous than black and white developers. Para-phenylene diamine, and its dimethyl and diethyl derivatives, are known to be highly toxic by skin contact and absorption, inhalation, and ingestion. They can cause very severe skin irritation, allergies and poisoning. Color developers have also been linked to lichen planus, an inflammatory skin disease characterized by reddish pimples which can spread to form rough scaly patches. Recent color developing agents such as 4-amino-N-ethyl-N-[p-methane-sulfonamidoethyl]-m-toluidine sesquisulfate monohydrate and 4-amino-3-methyl-N-ethyl-N-[3-hydroxyethyl]-aniline sulfate are supposedly less hazardous, but still can cause skin irritation and allergies.
3. Most amines, including ethylene diamine, tertiary-butylamine borane, the various ethanolamines, etc. are strong sensitizers, as well as skin and respiratory irritants.
4. Although many of the solvents are not very volatile at room temperature, the elevated temperatures used in color processing can increase the amount of solvent vapors in the air. The solvents are usually skin and eye irritants.

Precautions

1. Wear gloves and goggles when handling color developers. Wash gloves with an acid-type hand cleaner (e.g. pHisoderm (R)), and then water before removing them.
2. Mix powders in a glove box, or wear a NIOSH-approved toxic dust respirator.
3. Color processing needs more ventilation than black and white processing due to the use of solvents and other toxic components at elevated temperatures.

COLOR PROCESSING: BLEACHING, FIXING, AND OTHER STEPS

Many of the chemicals used in other steps of color processing are essentially the same as those used for black and white processing. Examples include the stop bath and fixing bath. Bleaching uses a number of chemicals, including potassium ferricyanide, potassium bromide, ammonium thiocyanate, and acids. Chemicals found in prehardeners and stabilizers include succinaldehyde and formaldehyde; neutralizers can contain hydroxylamine sulfate, acetic acid, and other acids.

Hazards

1. Formaldehyde is moderately toxic by skin contact, and highly toxic by inhalation and ingestion. It is an skin, eye and respiratory irritant, and strong sensitizer, and

is a probable human carcinogen. Formaldehyde solutions contain some methanol, which is highly toxic by ingestion.

2. Succinaldehyde is similar in toxicity to formaldehyde, but is not a strong sensitizer or carcinogen.
3. Hydroxylamine sulfate is a suspected teratogen in humans since it is a teratogen (causes birth defects) in animals. It is also a skin and eye irritant.
4. Concentrated acids, such as glacial acetic acid, hydrobromic acid, sulfamic acid and p-toluenesulfonic acids are corrosive by skin contact, inhalation and ingestion.
5. Acid solutions, if they contain sulfites or bisulfites (e.g., neutralizing solutions), can release sulfur dioxide upon standing. If acid is carried over on the negative or transparency from one step to another step containing sulfites or bisulfites, then sulfur dioxide can be formed.
6. Potassium ferricyanide will release hydrogen cyanide gas if heated, if hot acid is added, or if exposed to strong ultraviolet radiation.

Precautions

1. Local exhaust ventilation is required for mixing of chemicals and color processing.
2. Use premixed solutions whenever possible.
3. Avoid color processes using formaldehyde, if possible.
4. Wear gloves, goggles and protective apron when mixing and handling color processing chemicals. When diluting solutions containing concentrated acids, always add the acid to the water. An eyewash should be available.
5. A water rinse step is recommended between acid bleach steps and fixing steps to reduce the production of sulfur dioxide gas.
6. Do not add acid to solutions containing potassium ferricyanide or thiocyanate salts.
7. Control the temperature carefully according to manufacturer's recommendations to reduce emissions of toxic gases and vapors.

DISPOSAL OF PHOTOCHEMICALS

There is considerable concern about the effect of dumping photographic chemicals and solutions down the drain. The following recommendations are for disposing small volumes of photographic solutions daily.

1. Old or unused concentrated photographic chemical solutions, toning solutions, ferricyanide solutions, chromium solutions, color processing solutions containing high concentrations of solvents, and non-silver solutions should be treated as hazardous waste
2. Alkaline developer solutions should be neutralized first before being poured down the drain. This can be done with the stop bath or citric acid, using pH paper to tell when the solution has been neutralized (pH 7).
3. Stop bath left over from neutralization of developer can be poured down the drain, once mixed with wash water.
4. Fixing baths should never be treated with acid (e.g mixing with stop bath), since they usually contain sulfites and bisulfites which will produce sulfur dioxide gas.

5. Fixing baths contain large concentrations of silver thiocyanate, well above the 5 ppm of silver ion allowed by the U.S. Clean Water Act. Collect fixers and either pour into the silver recovery unit or dispose as hazardous waste.

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CLEAN UP – FOLLOW ALL OF THE RULES BELOW

Students must clean their work area and clean up communal areas after use.

MATERIALS SHOULD BE RETURNED TO THEIR PROPER CABINETS!

If you do not clean up, you will be emailed or addressed about this in person to come and correct the situation during school hours. If the student does not respond, a notice *will* be sent to the Associate Director.

If **three (3)** notices on an individual student are sent to the Associate Director over the course of a semester with no response from the student, a Disruptive Student Complaint will be filed with the Dean of Students' Office. Students who continually violate Photography area policies and procedures will be barred from taking classes in Photography and barred from use of Photography materials and facilities.

Unidentifiable objects and belongings left on the floor will be considered trash. The clean-up people will be directed to remove it.

General use worktables should be kept cleaned for other classes to use. Finished work and clutter should be cleared off and tables swept immediately upon completion of each work session. Do not use tabletops for storage.

Trash containers should not be overloaded. Heavy materials must be taken directly to the dumpster.

Each studio has specific rules for clean-up which should be followed, students should familiarize themselves with these rules.

CLEAN WALLS

There are designated **CLEAN WALLS** in the studio that are available for photographing and critiquing work. These walls should be kept clear for use during critiques and for photography. After use, students should remove any nails, screws or, push pins and repair holes. **DO NOT TIE-UP THESE AREAS FOR EXTENDED PERIODS OF TIME.**

MANDATORY CLEAN UP DAY

A clean-up day is scheduled at the end of every semester. Attendance for a two-hour time slot on cleanup day is MANDATORY for ALL students enrolled in a Photography course and for students in other courses that make significant use of the photography studio. Any materials left in the studio after the pre-cleanup deadline will be considered the property of the studio and either discarded or stored for common use. Students who fail to attend cleanup will have a registration bar placed on their record that will be lifted only after they complete their cleanup responsibility.

BANNED SUBSTANCES

Illegal drugs are not allowed in the studio at any time. Use of illegal drugs in the studio will result in the student's dismissal.

Legally prescribed and over the counter drugs should be used with caution when working in the studio.

Alcohol use is not permitted in the studios without prior university consent and approval procedures being followed. If university permission has been granted, all university procedures must be followed, a police officer must be present.

Certain Chemicals and Materials may be prohibited from use in the studio if it is determined that adequate protection for the student, his/her associates, or the environment is not available or in use.

Possession or use of banned substances in the studio is grounds for dismissal from the Photography program.

STUDIO/UNIVERSITY POLICY

Studio policies are in conjunction with and do not supersede but include all Georgia State University policies covered in the current catalog.

When a student is determined by faculty or the shop technician to be in violation of studio policy, a notice will be sent to the Associate Director of the School of Art & Design. Such notice is considered an official warning under the University Disruptive Student Policy (<https://deanofstudents.gsu.edu/files/2013/03/Disruptive-Student-Conduct-in-the-Classroom-or-Other-Learning-Environment-April-2006.pdf>). If a student receives 3 notices in the course of a single semester procedures will be initiated to withdraw the student from the course in accordance with the policy. Students who continually violate Photography area policies and procedures will be barred from taking classes in Photography and barred from use of Photography equipment and facilities.

"In the event that a student is unable to follow the procedures and policies outlined herein, and absent any emergency situation, prior approval must be given by a Photography faculty before any activity takes place. If policies are ignored or disregarded, the Photography area will file "A Disruptive Student Complaint" will be filed with the Dean of Students' Office. Multiple violations will be cause for dismissal from the university.