Wake Forest ® Baptist Health	Standa Proce Te	Standard Operating Procedure (SOP) Template				
CORROSIVES						
Effective Date:	1/18/2012	Revised	Date:	1/31/2012		
INTRODUCTION	1	I				
A Standard Operating Procedure (SOP) describes how your lab will handle a hazardous chemical safely, including the amount and concentration you will use, how you obtain or create the working solution, and special handling procedures, engineering controls, and personal protective equipment. Chemical-specific SOPs are found on the <u>EH&S website</u> . Wake Forest Baptist Medical Center has created Standard Operating Procedures (SOPs) for several chemical hazard categories and some commonly-used chemicals. The SOP provides only standard information and requires customization for each lab. The Occupational Safety and Health Administration (OSHA) requires a written SOP for any work with hazardous chemicals in laboratories. There are additional requirements for SOPs for particularly hazardous substances, or PHSs. These SOPs are an important part of the <u>Chemical Hygiene Plan</u> .						
GENERAL LAB RULE	S					
 No eating, drinking, smoking, handling contact lenses, or applying cosmetics in the laboratory. Persons shall wear buttoned lab coat, long pants, safety glasses or goggles and appropriate gloves when working with hazardous chemicals. Mouth pipetting is prohibited; mechanical pipetting devices are to be used at all times. All procedures are performed carefully to minimize the creation of splashes or aerosols. Wash hands after handling chemicals materials, after removing gloves, and before leaving the laboratory. 						
Common Corrosives The following tables list common types of acids and alkalis used at WFUHS.						
	TYPES OF ACIDS					
Hydrobromous	Acid	Nitrous Acid				
Hydrochlorous A	Acid	Phosphoric Acid				
Hydrochloric Ac	id	Phosphorous Aci	d			
Hydrofluoric Aci Hydroiodic Acid	a	Propionic Acid				

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	Muriatic Acid		S	Sulfurous Acid			
		TYPES	OF STRONG	OXIDIZING ACID	S		
	Chromic Acid		Ν	Nitric Acid (70%)			
	Hydrobromic Aci	d	F	Perchloric Acid			
	Iodic Acid						
	Peracetic Acid						
		т	YPES OF ORG	ANIC ACIDS			
	Acetic acid		F	henol			
	Benzoic acid		S	Sulfamic Acid			
	Chloroacetic Aci	d	S	Sulfanilic Acid			
	Formic Acid						
			TYPES OF	BASES			
	Ammonium Hvdr	oxide	F	Ricarbonates Sal	ts of: not	tassium	
			b	picarbonate, sodiu	um bicar	bonate,	
	Carbonates, Salt	s of calc	e sium C	etc. Calcium hydroxide	9		
	carbonate, sodiu	m carbo	nate, etc. S	Sodium Hydroxide	9		
	Potassium Hydro	oxide					
Add L	ab Specific Rules	Here					

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PURPOSE							
Add Lab Specific Purpo	ose Here						

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PHYSICAL HAZARDS							
 PHYSICAL HAZARDS General hazards include: Skin contact: Most concentrated acids and bases are corrosive and must immediately be flushed with water. Eyes are especially susceptible to liquids, vapors, dusts, or mists and must be immediately flushed with water if exposure occurs. Inhalation: Vapors, mists, and dusts act on the body in two ways: irritation of the air passages of the nose, throat, and lungs and absorption of the substance from the lungs into the blood stream. The seriousness of injury will depend on the concentration in air and on the duration of exposure. Ingestion: Ingestion causes severe burns of the mucous membranes of the mouth, throat, esophagus, and stomach. Most acids are liquids, and most bases are solids. Acids, especially when in concentrated form, are most likely to cause immediate pain when they come in contact with the body. Contact with strong bases, on the other hand, usually goes unnoticed since immediate pain does not occur. This allows the base time to react with the body part and a serious injury may result. Solid bases, when dissolved in water, can cause serious damage to eyes and skin by their corrosive action. Fine dust from almost any solid base can cause sevier damage to the eyes, upper respiratory tract, and lungs. Fine dust can also cause skin irritation, particularly to persons who have become wet or perspire freely. All of these materials are corrosive and will destroy body tissue. The seriousness of the injury depends on such factors as the type and concentration of the chemical, the body parts contacted, and the speed used in applying emergency measures. Concentrated aqueous solutions of inorganic acids are not in themselves flammable. Combustion can occur when an acid is mixed with other chemicals or with combustible materials. Acids also react with many metals, resulting in the liberation of hydrogen, a highly flammable gas. Some acids are strong oxidizing agents and can rea							
HEALTH HAZARDS							
FIRST AID Acids and alkalis	FIRST AID Acids and alkalis are caustic materials that can cause serious burns to the eves and						
 Acids and alkalis are caustic materials that can cause serious burns to the eyes and skin. In addition, many give off vapors that can cause serious damage to the mucous membranes. They are classified as primary irritants and cause damage by direct action on body tissues. It is essential to prevent skin and eye contact, but shall it occur, it is necessary to immediately flush the affected area with large amounts of clean water for at least fifteen. 							

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minutes to preve preventing dama	ent injury age. Afte	 The sooner the er the area is flus 	e area is flushed shed, medical at	I the bett tention is	er the chance of srequired.
 Eye Immediately flush the eye with clean tap water (flush the eye before other parts of the body) and dial the Medical Center emergency number 716-9111. Report the incidentan emergency team will be dispatched. Spread the eyelids with fingers, and allow water to flood the eye. Roll the eye about so that the water may contact all surfaces. Use nothing but clean water, and use plenty of it. Continue washing the eye with clean tap water until medical aid can be obtained. Skin Exposure Flush the exposed area thoroughly with plenty of clean water; remove contaminated clothing, and then gently flush the area again with water. Report to the Employee Health for treatment as soon as possible. Swallowing Follow all instructions on the container label. Dial the Medical Center Emergency number (716-9111) and report the incidentan emergency team will be dispatched. Save the container for medical personnel 					
PERSONAL PROTECT	IVE EQ	UIPMENT			
 EYE PROTECTION Safety glasses, goggles or face shields shall be worn during operations in which CORROSIVES might contact the eyes (e.g., through vapors or splashes of solution). Ordinary (street) prescription glasses do not provide adequate protection. Adequate safety glasses must meet the requirements of the Practice for Occupational Education Eye and Face Protection (ANSI Z87.1-1989) and must be equipped with side shields. HAND PROTECTION 					
 Laboratory personnel should thoroughly wash hands with soap and water before and immediately upon removal of gloves. 					
LAB COATS, ETC. • Button lab coats when handling C possibility of skir	, closed ORROS n contac	toed shoes, long SIVES. Protectiv t with CORROSI	g pants and long re clothing shall I VES.	sleeved be worn	clothing shall be worn to prevent any
The following personal Safety glasses v	orotectiv vith side	e equipment is ro shields	equired when us	ing acid	ls:

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 Face shield Rubber apron Long-sleeved sl Long pants 	hirt		i			
The following personal Safety glasses Face shield Rubber apron Long-sleeved sl Long pants	protective equipment is with side shields hirt	required when using	g alkalis :			
DESIGNATED AREA	FOR USE AND CONTA	INMENT DEVICES				
 It is recommend hood. When we Cabinets (BSC) exhausted to the The fume hood' minute is achiev Environmental H sticker to indica proper fume hood Contact Engine 	 It is recommended that all CORROSIVES work be conducted in the laboratory fume hood. When working with volatile, toxic chemicals, in limited amounts, Biological Safety Cabinets (BSC) Class II, Type A2 exhausted or Class II, Types B1and B2 BSCs exhausted to the outside can be used. The fume hood's sash must be in the position where a face velocity of 100 feet per minute is achieved. The BSC must be certified annually by a qualified outside vendor. Environmental Health and Safety certifies fume hoods annually and places a yellow sticker to indicate the date of certification and the proper sash height for achieving proper fume hood face velocity. Contact Engineering (716-4351) immediately if fume hood is malfunctioning. 					
SPECIAL HANDLING	PROCEDURES AND S	TORAGE REQUIRE	EMENTS			
 The corrosive properties of these materials and their ability to produce fires or explosions by combination with combustible materials make the following considerations mandatory in the selection of a storage site: A relatively cool, dry environment free from extremes of temperaturehumidity should be maintained. Acids and bases should be stored in a manner that separates them from other materials and from each other. Each acid or base should be stored in a manner consistent with its properties. When stored, small containers (approximately 1 gallon or less) should be placed on material that is acid-resistant; this facilitates flushing and other cleanup procedures in the event of leaks or spills. Carboys (approximately 5 gallons) should be stored in the same manner as small containers preferably covered, not stacked on one another, and on acid-resistant material. All drums (approximately 55 gallons) should be stored on individual racks or securely blocked on skids with the closure (plug) facing upward to prevent leakage. Drums 						

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containing acids thereafter) to rel	in liquid fo ieve accur	orm should be mulated interna	vented when rec al pressure.	ceived (a	nd at least weekly
These measures do not continual inspection of c	in any wa containers	ay eliminate the	e necessity for go	ood hous	sekeeping and for
 Storage Store large bottle Segregate oxidize Segregate acidse etc. Use bottle carriere Have spill-neutral 	es of acids zing acids from base ers for tran alizing age	s on low shelve from organic a es and active n sporting acid b ent available in	es or in acid stora icids, and flamma netals such as so ottles. case of acid spil	age cabii able and odium, p Ils.	nets. combustible liquids. otassium, magnesium,
 Handling When pipettes a acid into the pipe When mixing ac Plastic carriers s 	re used to ette shall b ids and wa shall be us	o remove small be by suction b ater, always ad sed to move ac	quantities of aci ottle and never b d acid to water. ids from one loca	ds from o by mouth NEVER ation to a	carboys, drawing of the n. add water to acid! another.
 The Occupation exhaust ventilati All areas where When the content is a possibility of following precautor Send emport 	 Use The Occupational Hygiene Officer should be consulted concerning the need for local exhaust ventilation, appropriate work practices and personal protective equipment. All areas where acids are used shall have local exhaust ventilation. When the contents of nitric acid or sulfuric acid containers are accidentally spilled, there is a possibility of serious injury to employees from breathing the acid vapors. The following precautions shall be observed: Send employees out of the area immediately if there is any possibility of them 				
 Call the Medical Center HazMat Team (6-9111) and Environmental Health & Safety (6-9375). Send any employee who has inhaled acid vapors to Employee Health Services immediately and notify the Emergency Department that the employees have been exposed to nitric acid vapors. Environmental Health & Safety will determine when the area is safe for resuming work. Standard Operating Procedures for Common Inorganic and Organic Acids are provided in the Chemical Safety Section of EH&S website. 					
 USE AND STORAGE OF ALKALIS Storage Segregate bases from acids. Store solutions of inorganic hydroxides in polyethylene containers. Have Spill-X-C available for spills of caustic solutions. 					

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 Handling Liquid alkali solutions should be moved from one place to another in a bottle carrier to prevent breakage in the event the container is dropped during transit or use. Use All areas where alkalis are used should have local exhaust ventilation. The Occupational Hygiene Officer should be consulted concerning the need for local exhaust ventilation, appropriate work practices, and personal protective equipment. Standard Operating Procedures for Common Inorganic Bases are provided in the Chemical Safety Section of the WFUHS EH&S Website. Add Lab Specific Special Handling/Storage Procedures 						
EMPLOYEE EXPOSUR Users of CORR(sampling/monito Individuals plane	 EMPLOYEE EXPOSURE MONITORING Users of CORROSIVES are required to notify EH&S at 716-9375 so air sampling/monitoring may be performed to determine exposure level. 					
 Individuals plant consultation, and Exposure monite 	d recommendations. oring through EH&S is f	ee of charge.	s for ex	cosure determination,		
CHEMICAL USE WITH ANIMALS						
CHEMICAL USE WITH ANIMALS Click here to enter text. Please consider other routes of exposure when handling animal (e.g., cage sign and) and animal bedding.						

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WASTE DISPOSAL							
 Chemicals shall not be drain disposed unless prior approval is given by EH&S. Excess CORROSIVES and all waste material containing CORROSIVES must be placed in an unbreakable secondary container labeled with the following "HAZARDOUS WASTE CORROSIVES". Full containers of <u>CORROSIVES</u> waste must be disposed of according to the <u>EH&S</u> <u>Hazardous Waste Program</u>. A <u>Waste Ticket</u> must be completed and submitted prior to disposing of CORROSIVES through EH&S. 							
EMERGENCY PROCE	DURES						
Emergency Numbers:							
Fire and Medical Emer	gencies	716-9111 (9 + 911 fc campuses	or Friedb)	erg and PTRP			
Principal Investigator's	Emergency Number	Click here	to enter	text.			
Employee Health		716-4801					
Hospital Emergency Ro	Hospital Emergency Room 716-9		16-9008				
Environmental Health a	Environmental Health and Safety 716-9375						
Laboratory Contact Information:							
Click here to enter text		Click here to	enter te	ext.			
Click here to enter text		Click here to e		ext.			
Click here to enter text	t.	Click here to	enter te	ext.			

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FIRST AID						
The nearest safetyThe nearest safety	shower station is loo eyewash is located:	cated: <u>Insert text here</u> Insert text here				
If chemical exposur eyewash station and	e occurs, flush expo d/or safety shower.	osed area for 15 to 20	minutes	s using emergency		
 Call 716-9111 and c Keep people out of 	describe the extent of the area.	of injuries, chemical s	pilled an	d the amount.		
 Report all accidenta Complete an <u>online</u> there is an accident 	I exposures to Emp injury/illness report involving the chem	loyee Health Services if there is an over-exp ical.	s. posure to	o the chemical or if		
SPILL AND ACCIDEN	PROCEDURES					
If the chemical spilled is considered a carcinogen, reproductive toxin or highly toxic chemical, contact 716-9111 and evacuate area immediately, regardless of spill amount. If you are unsure of type of chemical, contact 716-9111. For all other spills use the chart below for spill reporting and response: <u>Chemical Spill Procedures</u>						
SPILL Q	SPILL QUANTITY PROPER SPILL RESPONSE					
Spill less th	an 300 mL	00 mL Contact Environmental Health and Safety (716 9375) and clean up spill using spill kit.				
Spill greater	than 300 mL	Do not attempt to clean up spill. Leave the Area and immediately report to WFBMC Security (716-9111).				

CERTIFICATION OF APPLICATION PLEASE READ THESE ITEMS AUTOMATICALLY BECOME A PART OF YOUR SOP

- 1. I understand that it is my responsibility to assure that all personnel working in my laboratory with any of these hazards are fully informed about their specific dangers, proper actions for safe use, steps to take in case of accidents, and are provided with all necessary safety equipment and instructions in its use.
- 2. I agree to follow the provisions of the <u>Chemical Hygiene Plan</u>.
- 3. I will ensure that all of my personnel attend Basic Lab Safety Training by EH&S prior to using chemical materials.
- 4. I agree to permit Representatives of WFSM Environmental Health and Safety to inspect the facilities where this work is being conducted.
- 5. All chemical waste will be disposed of through EH&S Chemical Waste Program. I understand that **drain disposal is <u>NOT allowed</u>**.
- 6. Chemical materials will be transported in closed containers.
- 7. Sharps and/or breakable plastic solid waste items will be placed in approved punctureresistant container, i.e., a sharps container.
- As soon as possible, the Chemical Occupational Hygiene Officer will be notified in writing of any proposed changes in locations where chemical materials are stored or used.
- 9. Additional chemicals or changes in possession limits will be requested in writing from the Chemical Occupational Hygiene Officer.
- 10. Chemical materials will not be transferred to other Authorized Users without prior approval of the Chemical Occupational Hygiene Officer.
- 11. Chemical materials will not be shipped anywhere off campus without prior approval of the Chemical Occupational Hygiene Officer.
- 12. Secure chemicals (including waste) to prevent unauthorized access or removal. In addition, you must control and maintain constant surveillance of chemicals that are not in storage or are in use. This can be achieved by: 1) Locking refrigerators and/or storage cabinets, 2) Locking the laboratory when no one is present, and 3) Challenging unknown persons entering the laboratory.
- 13. I will notify the Chemical Occupational Hygiene Officer of my intent to leave WFUHS at least **60 days** in advance. I will be responsible for disposing of my chemical materials inventory through EH&S Chemical Waste Program.

First	Last	Signature
Click here to enter text.	Click here to enter text.	
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