

SOP FOR CARCINOGENS & REPRODUCTIVE AGENTS

A carcinogen commonly describes any agent that can initiate or speed the development of malignant or potentially malignant tumors, malignant neoplastic proliferation of cells, or cells that possess such material. Because of the potentially serious health consequences presented by reproductive agents, these agents are to be handled in the same manner as carcinogens. Personnel are to take every measure possible to prevent exposure to these agents.

Reproductive agents may affect the reproductive health of women or men or the ability of couples to have healthy children. These hazards may cause problems such as infertility, miscarriage, and birth defects.

Personnel should review the UofR's Chemical Safety Manual for Laboratory Carcinogens and Reproductive Agents for the safe handling of OSHA and IARC Group 1 carcinogens and reproductive hazards.

Securing of gas cylinders

Not applicable.

Decontamination procedures

Personnel: Wash hands and arms with soap and water immediately after handling carcinogens.

Area: Decontamination procedures vary depending on the material being handled. The toxicity of some materials can be neutralized with other reagents. All surfaces should be wiped with the appropriate cleaning agent following dispensing or handling. Waste materials generated should be treated as a hazardous waste.

Equipment: Decontaminate vacuum pumps or other contaminated equipment (glassware) before removing them from the designated area.

Designated area

All locations within the laboratory where carcinogens/reproductive agents are handled should be demarcated with designated area caution tape or posted with designated area caution tape. This includes all fume hoods and bench tops where the carcinogens are handled.

Where feasible, carcinogens/reproductive agents should be manipulated over plastic-backed disposable paper work surfaces. These disposable work surfaces minimize work area contamination and simplify clean up.

Emergency procedure

Emergency procedures address response actions to fires, explosions, spills, or injury to staff. Utilize the information available in the "Emergency 13" flip chart. The following emergency phone numbers should be utilized to initiate an emergency response:

All emergencies:	x13 (Public Safety)
Chemical Exposures:	x5-4955 (UHS)
Laboratory Safety Unit	x5-2402
Occupational Safety Unit:	x5-3241

recommended. Personnel should wear non-skid sole shoes. The following types of shoes are not recommended: open-toes shoes, open heeled shoes, shoes made with cotton or a material that readily absorbs liquids.

Safety shielding

Safety shielding is required any time there is a risk of explosion, splash hazard or a highly exothermic reaction. All manipulations of carcinogens/reproductive agents which pose this risk should occur in a fume hood with the sash in the lowest feasible position. Portable shields, which provide protection to all laboratory occupants, are acceptable.

Safety shower

A safety or drench shower should be available within 100 feet where carcinogens/reproductive agents are used. The path to the shower must be clear and unobstructed.

Signs and labels

Doorways: The room sign must be posted to warn that carcinogens/ reproductive hazards are stored or used.

Work Locations All areas where carcinogens/reproductive agents are stored or manipulated must be labeled as a designated area.

Containers: All carcinogens/reproductive agents must be clearly labeled with the correct chemical name and hazard warning. Handwritten labels are acceptable; chemical formulas and structural formulas are not acceptable.

Special storage

Carcinogens/reproductive agents must be stored in a designated area.

Special ventilation

Manipulation of carcinogens outside of a fume hood may require special ventilation controls in order to minimize exposure to the material. Fume hoods provide the best protection against exposure to carcinogens in the laboratory and are the preferred ventilation control device. Where possible, handle carcinogens in a fume hood. If the use of a fume hood proves impractical attempt to work in a glove box or in an isolated area on the laboratory bench top.

If available, consider using a Biological Safety Cabinet (BSC). The BSC can be used to remove those materials that are in particulate form. Volatile carcinogens/reproductive agents must not be used in a biological safety cabinet unless the cabinet is ducted to the outdoors.

If your research does not permit the handling of volatile carcinogens/reproductive agents in a fume hood, biological safety cabinet, or glove box, contact the Laboratory Safety Unit for assistance.

Spill response

Anticipate spills by having the appropriate clean up equipment on hand. The appropriate clean up supplies can be determined by consulting the safety data sheet. This should occur prior to the use of any carcinogen.

In the event of a spill, alert personnel in the area that a spill has occurred. Do not attempt to handle a large spill of carcinogenic or reproductive agent. Vacate the laboratory immediately and call Public Safety (x13) for a spill response. Remain on the scene, but at a safe distance, to receive and provide information to safety personnel when they arrive.

Vacuum protection

Evacuated glassware can implode and eject flying glass, and splattered chemicals. This type of glassware must be wrapped or taped for protection.

Mechanical vacuum pumps must be protected using cold traps and, where appropriate, filtered to prevent particulate release. The exhaust for the pumps must be vented into a chemical fume hood.

Waste disposal

All materials contaminated with carcinogens should be disposed of as a hazardous waste. Wherever possible, attempt to design research in a manner that reduces the quantity of waste generated. Questions regarding waste pick up should be directed to the Environmental Compliance / Hazardous Waste Management Unit (x5-2056). This office can also assist you in minimizing waste generation.

SELECTED CARCINOGENS **

NAME	CAS#	NAME	CAS#
Arsenic and arsenic compounds	7440-38	Asbestos	12001-29-5
Azathioprine	446-86-6	Benzene	71-43-2
Benzidine	92-87-5	N,N-bis(2-chloroethyl)-2-naphthylamine Bis(chloromethyl)ether	494-03-1
1,4-butanediol dimethylsulfonate (myleran)	55-98-1	Certain combined chemotherapy for lymphomas	
Chlorambucil	305-03-3	Chloromethyl methyl ether	107-30-2
Chromium and chromium compounds	744-047-3	Conjugated estrogens	
Cyclophosphamides	50-18-0	Diethylstilbestrol	56-53-1
Melphalan	148-82-3	Methoxsalen with ultra-violet A therapy (PUVA)	298-81-7
B-Naphthylamine	91-59-8	Soots, tars, and mineral oils	
Thorium dioxide	1314-20-1	Vinyl chloride	75-01-4

** THIS LIST IS PROVIDED AS A GUIDE AND IS NOT ALL INCLUSIVE. REVIEW THE UofR's CHEMICAL SAFETY MANUAL FOR LABORATORY CARCINOGENS AND REPRODUCTIVE AGENTS FOR A MORE DETAILED LISTING. CAREFULLY REVIEW SAFETY DATA SHEET BEFORE WORKING WITH CHEMICALS.

SUSPECTED CARCINOGENS **

NAME	CAS#	NAME	CAS#
2-Acetyaminofluorine	53-96-3	Acrylonitrile	105-13-1
Adriamycin	232-14-92-8	Aflatoxins	
2-Aminoanthraquinone	117-79-3	1-Amino-2-methyl-anthraquinone	82-28-0
Amitrole	61-82-5	o-Anisidine	90-04-0
0-Anisidine hydrochloride	134-29-2	Aramite	140-57-8
Benz(a)anthracene	56-55-3	Benzo(b)fluoranthrene	205-99-2
Benzo(a)pyrene	50-32-8	Benzotrichloride	98-07-7
Beryllium & beryllium cmpds.	7440-41-7	Bischloroethyl nitrosourea	154-93-8
Cadmium & cadmium cmpds.	7440-43-9	Carbon tetrachloride	56-23-5
1-(2 cycloethyl)-3-cyclohexyl-1-nitrosourea (CCNU)	130-10-47-4	Chloroform	67-66-3
4-Chloro-o-phenylenediamine	95-83-0	p-Cresidine	120-71-8
Cupferron	135-20-6	Cycasin	14901-08-7
Dacarbazine	4342-03-4	DDT	50-29-3
2,4-Diaminoanisole sulfate	39156-41-7	2,4-Diaminotoluene	95-80-7
Dibenzo(a,h)acridine	226-36-8	Dibenzo(a,j)acridine	224-42-0
Dibenz(a,h)anthracene	53-70-3	7H-Dibenzo(c,g)carbazole	194-59-2
Dibenzo(a,h)pyrene	189-64-0	Dibenzo(a,i)pyrene	189-55-9
1,2-Dibromo-3-chloropropane	96-12-8	1,2-Dibroethane (EDB)	106-93-4
3,3'-Dichlorobenzidine	91-94-1	1,2-Dichloroethane	107-06-2
Diepoxybutane	1464-53-5	Di(2-ethylhexyl) phthalate	117-81-7
Diethyl sulfate	64-67-5	3,3'-Dimethoxybenzidine	119-90-4
4-Dimethylamino azobenzene	60-11-7	3,3'Dimethybenzidine	119-93-7
Dimethylcarbamoyl chloride	79-44-7	1,1-Dimethylhydrazine	57-14-7
Dimethyl sulfate	77-78-1	1,4-Dioxane	123-91-1

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SUSPECTED CARCINOGENS (cont) **

NAME	CAS#	NAME	CAS#
Direct Black	1937-37-7	Direct Blue	2602-46-2
Epichlorohydrin	106-89-8	Estrogen (not conjugated): 1.Estradiol 17B	50-28-2
Estrone	53-16-7	Ethynylestradiol 3-methyl ether	72-33-3
Estrogen (not conjugated): 4.Mestranol	72-33-3	Ethylene oxide	75-21-8
Ethylenethiourea	96-45-7	Formaldehyde (Formalin solutions)	50-00-0
Hexachlorobenzene	118-74-1	Hexamethylphosphoramide	680-31-9
Hydrazine and hydrazine sulfate	10034-93-2	Hydrazobenzene	302-01-2
Indeno(1,2,3-cd) pyrene	193-39-5	Iron dextran complex	9004-66-4
Kepone(Chlorodecone)	143-50-0	Lead acetate and lead phosphate	301-04-2
Lindane and other hexa- chlorocyclohexane isomers	58-89-9	2-Methylaziridine (propyleneimine)	75-55-8
4,4'-Methylenebis(2- chloroaniline) (MBOCA)	101-14-4	4,4'-Methylenebis(N, n-dimethyl)benzenamine	101-61-1
4,4'-Methylenedianiline	101-77-9	4,4'Methylenedianiline HCl	13552-44-8
Methyl iodine	74-88-4	Metronidazole	443-48-1
Michler's ketone	90-94-8	Mirex	2385-85-5
Nickel and certain nickel cmpds.	7440-02-0	Nitrilotriacetic acid	139-13-9
5-Nitro-o-anisidine	99-59-2	Nitrofen	1836-75-5
Nitrogen mustard	51-75-2	2-Nitropropane	79-46-9
N-Nitrosodibutylamine	924-16-3	N-Nitrosodiethanolamine	1116-54-7
N-Nitrosodiethylamine	55-18-5	N-Nitrosodimethylamine	62-75-9
p-Nitrosodiphenylamine	156-10-5	N-Nitrosodi-n-propylamine	621-64-7
N-Nitroso-N-ethylurea	759-73-9	N-Nitroso-N-methylurea	684-93-5
n-Nitrosomethylvinylamine	4549-40-0	N-Nitrosomorpholine	59-89-2
N-Nitrosornicotine	16543-55-8	N-Nitrosopiperidine	100-75-4
N-Nitrosopyrrolidine	930-55-2	N-Nitrososarcosine	13256-22-9

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SUSPECTED CARCINOGENS (cont) **

NAME	CAS#	NAME	CAS#
Norethisterone	68-22-4	Oxymetholone	434-07-1
Phenacetin	62-44-2	Phenazopyridine hydrochloride	136-40-3
Phenytoin	57-41-0	Phenytoin, Sodium salt	630-93-3
Polybrominated biphenyls	59536-65-1	Polychlorinated biphenyls	1336-36-3
Procarbazine	366-70-1	Procarbazine hydrochloride	366-70-1
Progesterone	57-83-0	1,3-Propane sultone	1120-71-4
B-Propiolactone	57-57-8	Propylthiouracil	51-52-5
Reserpine	50-55-5	Saccharin	81-07-2
Safrole	94-59-7	Selenium sulfide	7446-34-6
Streptozocin	18883-66-4	Sulfallate	95-06-7
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6	Thioacetamide	62-55-5
Thiourea	62-56-6	Toluene diisocyanate	584-84-9
o-Toluidine	95-53-4	0-Toluidine hydrochloride	636-21-5
Toxaphene	8001-35-2	2,4,6-Trichlorophenol	88-06-2
Tris(1-aziridinyl) phosphine	52-24-4	Tris(2,3-dibromo-propyl)phosphate	126-72-7
Urethane	51-79-6		

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REPRODUCTIVE HAZARDS **

NAME	CAS#	NAME	CAS#
Acetaldehyde	75-07-0	Arsenic	7440-38-2
Aniline	62-53-3	Aflatoxins	
Benzene	71-43-2	Benzo(a)pyrine	50-32-8
Carbon disulfide	75-15-0	Chloroform	67-66-3
Chloroprene	126-99-8	Dimethyl formamide	68-12-2
Di-sec-octyl-phthalate	117-81-7	2-Ethoxyethanol	110-80-5
Dithane	111-54-6	Ethylenethiourea	96-45-7
2-Ethoxyethyl acetate	111-15-9	Glycol ethers	
2-Ethylhexanol	104-76-7	Hexafluoroacetone	684-16-2
Hydrazine(s)		Karathane	131-72-6
Halothane	151-67-7	2-Methoxyethanol	109-86-4
Lead (inorganic compounds)	7439-92-1	Methyl chloride	74-87-3
2-Methoxyethyl acetate	110-49-6	Propylene glycol monomethyl ether	107-98-2
n-Methyl-2-pyrrolidone	872-50-4	Propylene oxide	75-56-9
Propylene glycol monomethyl ether acetate	108-65-6	TOK (herbicide)	1836-75-5
Trichloroethylene	79-01-6	Vinyl chloride	75-01-4
Toluene	108-88-3		

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