

Chemical safety is of utmost concern across academia. Therefore, approval must be obtained from the Institutional Biosafety Committee (IBC) at the University of Texas at Tyler (UT Tyler) before ordering and using certain chemical agents. The principal investigator / laboratory supervisor is responsible for obtaining approval prior to the initiation of any procedure involving the referenced chemicals.

1. Determine if chemical requires approval.

The IBC reviews any chemical agent listed in the Appendices I-IV, below. However, any material not found to be on the list may meet the criteria based on specific information from the Safety Data Sheet (SDS) and Globally Harmonized System (GHS).

When ordering a hazardous chemical(s) that is not currently inventoried in your laboratory, shop, or studio (new-use chemical), an application for approval to use any agent listed in Appendices I-III must be submitted to the IBC for review and approval.

Section 2-4 outlines the submittal process.

A. Restricted chemicals.

Agents listed in appendix IV may not be purchased under any circumstances unless an exemption is granted by the IBC.

B. Other applicable chemicals.

The chemical list below are common laboratory and shop chemicals. However, the list is not exhaustive. The IBC would need to grant approval for use of:

- 1) GHS Physical Hazard, category 1 or 2, excluding explosives, pyrophoric substances, organic peroxides and self-reactive substances which are restricted
- 2) GHS Health Hazards, category 1 (A or B if applicable) or 2
- 3) GHS Environmental Hazards, category 1, or 2
- 4) Any nanomaterial/nanoparticle, including chemicals to manufacture or synthesize such material

C. Training and use.

The PI or supervisor is responsible for training personnel in their spaces on the health risks associated with the material, required personal protective equipment for working with the material, safe handling of the material, and proper storage and disposal of the material.

2. Completion of the form titled “Hazardous Chemical Protocol Form.”

If a chemical requires committee review, then an “Hazardous Chemical Protocol Form” must be completed and submitted to the IBC. You may find the “Hazardous Chemical Protocol Form” available in this document, below. Please submit the form by email to galina.florova@uttyler.edu and liz.declet@uttyler.edu.

3. Completion of a Standard Operating Procedure form

Standard Operating Procedures (SOP) must be submitted for each chemical reported on the “Hazardous Chemical Protocol Form.” The SOP should follow a template and include the SDS attached to the end of the form. UT Tyler IBC has approved SOPs for many common hazardous chemicals. The Research Compliance Department can assist with writing a new SOP. The blank SOP form is available in this document, below.

4. Submission and approval by the IBC

Once the appropriate forms are completed and submitted, the IBC reviews the protocol based on the criteria included in the “Hazardous Chemical Protocol Form”. The IBC will then evaluate the protocol and grant approval to use the chemical agent. In some cases, approval may be granted with the stipulation that certain environments and recommendations are applied and adhered to during the experimental proto



The University of Texas at Tyler
Application for Approval to Use Carcinogenic, Highly Toxic, or Acutely Hazardous Chemicals

Protocol #	
Date Received:	
Date Approved:	

1. Principal Investigator Information

Principal Investigator: _____ Phone: _____

Department: _____

Designated area where chemical will be used: _____

Changes required to upgrade the facility: _____

☐ UT Main Campus

☐ UT Health Science Center

2. Chemical Information

Chemical Name	Source	Catalog Number	Maximum Quantity to be Purchased at One Time

3. Hazard Information

Chemical Name	CAS#	Physical Form			Type of Hazard				
		Solid	Liquid	Gas	Carcinogen	Reproductive Toxin	Acute Toxicity	Skin Hazard	Other (please indicate type of hazard)

4. Personal Protective Equipment and Safety Equipment

For each chemical listed above, describe the PPE and safety barriers that will be used to protect personnel.

Chemical Name	PPE (specify type of gloves*; lab coat, shoe covers, eye protection; and/or head covering to be used)	Will a chemical fume hood be used for handling the reagent?	What type of respirator or other respiratory protection will be used? N95 respirators require fit testing prior to use and annually thereafter.	Is the MSDS available electronically or in paper format in the lab?

* Latex gloves are not appropriate for work with many chemicals

5. Are any of the chemicals listed DEA controlled Substances?

6. List all procedures the chemicals will be used for.

7. Waste disposal procedures

Chemical	Procedure to dispose of liquid waste	Procedure to dispose of solid waste

8. Personnel

Name	Title	Chemicals individual will work with	Has individual received specific training for working with these chemicals?	Training Date

9. Principal Investigator Statement of Assurance

As principal investigator, I understand that I am ultimately responsible for the control of carcinogenic, highly toxic, or acutely hazardous chemicals. Before any work begins with these chemicals, personal instruction in safe use, handling, containment, and proper disposal will be given to laboratory workers and their understanding documented. Additionally, procedures for handling personal injury or accidental exposure must also be reviewed.

Signature of PI

Date

Guidelines for working with at the University of Texas at Tyler

Chemical Name:

Chemical Abstracts Service (CAS) number:

Synonyms:

General information:

Potential Hazards:

Handling and Storage:

Personal Protective Equipment:

Engineering Controls:**Disposal:****Acknowledgement**

As Principal Investigator, I understand that I and all members of my laboratory must follow this SOP when working with these substances. I also acknowledge that I am ultimately responsible for ensuring that all members of my laboratory follow all the policies of the University of Texas at Tyler and all Federal and State policies, laws, and guidelines concerning the use of hazardous materials. All members of my laboratory will receive appropriate training for the use of this reagent including procedures for storage and handling, proper PPE and engineering controls to be used, and methods used to dispose of liquid and solid waste.

Signature of PI

Date

Appendix I: General Hazardous Chemicals

CAS No	Agent
000079-06-1	Acrylamide
023214-92-8	Adriamycin
001402-68-2	Aflatoxins (naturally occurring mixtures of)
000107-05-1	Allyl Chloride
000092-67-1	4-Aminobiphenyl
	Androgenic (anabolic) steroids
	Aristolochic acids
007440-38-2	Arsenic and arsenic compounds
001332-21-4	Asbestos
000320-67-2	Azacitidine
000446-86-6	Azathioprine
025843-45-2	Azoxymethane
000071-43-2	Benzene
000092-87-5	Benzidine
000050-32-8	Benzo[a]pyrene
007440-41-7	Beryllium and beryllium compounds
000494-03-1	N,N-Bis(2-chloroethyl)-2-naphthylamine (Chlornaphazine)
000542-88-1, 000107-30-2	Bis(chloromethyl)ether and chloromethyl methyl ether (technical-grade)
000154-93-8	Bischloroethyl nitrosoourea (BCNU)
000106-99-0	1,3-Butadiene
000055-98-1	1,4-Butanediol dimethanesulfonate (Busulphan, (Myleran®)
007440-43-9	Cadmium and cadmium compounds
002425-06-1	Captafol
009012-76-4	Chitosan
000305-03-3	Chlorambucil
000056-75-7	Chloramphenicol
000098-87-3, 000098-07-7, 000100-44-7, 000098-88-4	a-Chlorinated toluenes (benzal chloride, benzotrichloride, benzyl chloride) and benzoyl chloride (combined exposures)
013010-47-4	1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosoourea (CCNU)
013909-09-6	1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1- nitrosoourea (Methyl-CCNU, Semustine)
000095-69-2	4-Chloro-ortho-toluidine
054749-90-5	Chlorozotocin
07440-47-3	Chromium [VI]
015663-27-1	Cisplatin
008001-58-9	Creosotes
027208-37-3	Cyclopenta[cd]pyrene
000050-18-0, 006055-19-2	Cyclophosphamide
079217-60-0	Cyclosporine
000053-70-3	Dibenz[a,h]anthracene
000191-30-0	Dibenzo[a,l]pyrene
000056-53-1	Diethylstilboestrol
000064-67-5	Diethyl sulfate
000079-44-7	Dimethylcarbamoyl chloride
000540-73-8	1,2-Dimethylhydrazine
000077-78-1	Dimethyl sulfate
	Direct Black 38
	Direct Blue 6

Appendix I: General Hazardous Chemicals

CAS No	Agent
000106-89-8	Epichlorohydrin
066733-21-9	Erionite
	Estrogens, nonsteroidal
	Estrogens, steroidal
001239-45-8	Ethidium bromide
000051-79-6	Ethyl carbamate (urethane)
000106-93-4	Ethylene dibromide
000075-21-8	Ethylene oxide
000759-73-9	N-Ethyl-N-nitrosourea
033419-42-0	Etoposide
033419-42-0	Etoposide in combination with cisplatin and bleomycin
000050-00-0	Formaldehyde
001303-00-0	Gallium arsenide
000556-52-5	Glycidol
022398-80-7	Indium phosphide
000301-04-2	Lead acetate
076180-96-6	IQ (2-Amino-3-methylimidazo[4,5-f]quinoline)
000148-82-3	Melphalan
000484-20-8	5-Methoxypsoralen
000101-14-4	Methylenebis(chloroaniline) (MOCA)
000066-27-3	Methyl methanesulfonate
000070-25-7	N-Methyl-N'-nitro-N-nitrosoguanidine (MNNG)
000684-93-5	N-Methyl-N-nitrosourea
	MOPP and other combined chemotherapy including alkylating agents
000505-60-2	Mustard gas (Sulfur mustard)
	Nanoparticles or nanomaterials GOLD NANOPARTICLES
000091-59-8	2-Naphthylamine
	Nickel compounds
000051-75-2	Nitrogen mustard
016543-55-8	N'-Nitrosornicotine (NNN) and 4- (NNitrosomethylamino)- 1-(3-pyridyl)-1-butanone
064091-91-4	(NNK)
000055-18-5	N-Nitrosodiethylamine
000062-75-9	N-Nitrosodimethylamine
000062-44-2	Phenacetin and analgesic mixtures containing
001336-36-3	Polychlorinated biphenyls
000366-70-1	Procarbazine hydrochloride
014808-60-7	Silica, crystalline
000096-09-3	Styrene-7,8-oxide
010540-29-1	Tamoxifen
029767-20-2	Teniposide
001746-01-6	2,3,7,8-Tetrachlorodibenzo-para-dioxin
000127-18-4	Tetrachloroethylene
000052-24-4	Thiotepa
000095-53-4	ortho-Toluidine
000299-75-2	Treosulfan
000076-03-9	Trichloroacetic acid
000079-01-6	Trichloroethylene
000067-66-3	Trichloromethane (chloroform)
000096-18-4	1,2,3-Trichloropropane
000126-72-7	Tris(2,3-dibromopropyl) phosphate

Tris(2-carboxyethyl) phosphine hydrochloride)

Appendix I: General Hazardous Chemicals

CAS No	Agent
000051-79-6	Urethane (see Ethyl carbamate)
000593-60-2	Vinyl bromide
000075-01-4	Vinyl chloride
000075-02-5	Vinyl fluoride

Appendix: II Pesticides

Compound	CAS No.	Compound	CAS No.
Abate (Temephos)	3383-96-13	2,4-DB acid	94-82-6
Acifluorfen	62476-59-9	DCPA (Dacthal)	2136-79-0
Alachlor	15972-60-8	2,4'-DDD	53-19-0
Aldrin	309-00-2	4,4'-DDD	72-54-8
Ametryn	834-12-8	2,4'-DDE	3424-82-6
Amoban	608775	4,4'-DDE	72-55-9
AOP	--	2,4'-DDT	789-02-6
Asponb	3244-90-4	4,4'-DDT	50-29-3
Atraton	1610-17-9	DEF (Butifos)	78-48-8
Atrazine	1912-24-9	Demeton-O	298-02-3
Azinphos-ethyla	2642-71-9	Demeton-Oc	8065-48-3
Azinphos ethyl (Ethyl guthion)	642-71-9	Demeton-S	126-75-0
Azinphos methyl (Guthion)	86-50-0	Demeton-Sc	8065-48-3
a-BHC	319-84-6	Diallate	2303-16-4
β-BHC	319-85-7	Diazinon	333-41-5
γ-BHC (Lindane)	58-89-9	1,2-Dibromo-3-chloropropane	96-12-8
d-BHC	319-86-8		
Bendiocarb	22781-23-3	Dicamba	1918-00-9
Benfluralin	1861-40-1	Dichlobenil (Casoron)	1194-65-6
Bolstar (Sulprofos)	35400-43-2	3,5-Dichlorobenzoic acid	51-36-5
Bromacil	314-40-9	Dichlorofenthiona	97-17-6
Bromoxynil (Brominal)	1689-84-5	Dichlorprop	120-36-5
Busan 40	51026-28-9	Dichlorvos (DDVP)	62-73-7
Busan 85	128-03-0	Diclofol (Kelthane)	115-32-2
Butachlor	23184-66-9	Diclofop-methyl	51338-27-3
Butylate	2008-41-5	Dicrotophosa	141-66-2
Carbophenothiona	786-19-6	Dieldrin	60-57-1
Captafol	191906	Dimethoate	60-51-5
Captan	133-06-2	Dinoseb	88-85-7
Carboxin	5234-68-5	Dioxathion	78-34-2
cis-Chlordane	5103-71-9	Diphenamid	957-51-7
trans-Chlordane	5103-74-2	Disulfoton (Disyston)	298-04-4
Chlordane -- not otherwise specified (n.o.s.)	57-74-9	Disulfoton sulfone	2497-06-05
		Disulfoton sulfoxidea	2497-07-06
Chlorfenvinphosa	470-90-6	Diuron	330-54-1
Chlorobenzilate	510-15-6	Endosulfan I	959-98-8
Chlorpropham	101-21-3	Endosulfan II	33213-65-9
Chlorpyrifos	2921-88-2	Endosulfan sulfate	1031-07-8
Chlorpyrifos methyla	5598-13-0	Endrin	72-20-8
Chlorthalonil (Daconil)	1897-45-6	Endrin aldehyde	7421-93-4
Coumaphos	56-72-4	Endrin ketone	53494-70-5
Crotoxyphosa	7700-17-6	EPN	2104-64-5
Cyanazine	21725-46-2	Eptam (EPTC)	759-94-4
Cycloate	1134-23-2	Ethalfuralin (Sonalan)	55283-68-6
2,4-D acid	94-75-7	Ethion	563-12-2

Appendix: II Pesticides

Ethoprop	13194-48-4	Naled	300-76-5
Famphura	52-85-7	Napropamide	15299-99-7
Fenamiphos	22224-92-6	Niacide	8011-66-3
Fenarimol	60168-88-9	4-Nitrophenol	100-02-7
Fenitrothion	122-14-5	Norflurazon	27314-13-2
Fensulfothion	115-90-2	Oxyfluorfen	42874-03-3
Fenthion	55-38-9	Parathion, ethyl	56-38-2
Ferbam	14484-64-1	Parathion, methyl	298-00-0
Fluridone	59756-60-4	Pebulate	1114-71-2
Fonophosa	944-22-9	Pendimethalin	40487-42-1
Gardona (Tetrachlorvinphos)	961-11-5	Pentachlorophenol (PCP)	87-86-5
Heptachlor	76-44-8	o-Phenylenediamine	95-54-5
Heptachlor epoxide	1024-57-3	Phorate	298-02-2
Hexachlorobenzene	118-74-1	Phosmet	732-11-6
Hexachlorocyclopentadiene	77-47-4	Phosphamidon	297-99-4
Hexamethyl phosphoramidea (HMPA)		Phosphamidon	13171-21-6
	680-31-9	Picloram	2/1/1918
Hexazinone	51235-04-2	Polyram	9006-42-2
Imidan (Phosmet)	732-11-6	Profluralin	26399-36-0
Ioxynil	1689-83-4	Prometon (Pramitol 5p)	1610-18-0
Isodrin	465-73-6	Prometryn	7287-19-6
KN Methyl	137-41-7	Pronamide (Kerb)	23950-58-5
Leptophos	21609-90-5	Propachlor (Ramrod)	1918-16-7
Malathion	121-75-5	Propargite (S-181)	2312-35-8
Mancozeb	1/7/8018	Propazine	139-40-2
Maneb	12427-38-1	Propetamidophos	31218-83-4
MCPA acid	94-74-6	Propham	122-42-9
MCPP acid	7085-19-0	Prosulfocarb	52888-80-9
Merphos	150-50-5	Ronnel	299-84-3
Metalaxyl	57837-19-1	Silvex (2,4,5-TP)	93-76-5
Metham	137-42-8	Simazine	122-34-9
Methiocarb	2032-65-7	Simetryn	1014-70-6
Methoxychlor	72-43-5	Sodium dimethyldithiocarbamat	128-04-1
Methyl chlorpyrifos	5598-13-0	Stirophos (Tetrachlorvinphos, Gardona)	22248-79-9
Methyl paraoxon	311-45-5		
Methyl paraoxon	950-35-6	Sulfotepp	3689-24-5
Methyl parathion	298-00-0	Sulprofos (Bolstar)	35400-43-2
Metolachlor	51218-45-2	2,4,5-T acid	94-82-6
Metribuzin	21087-64-9	2,4,5-TB	93-80-1
Mevinphos	7786-34-7	Tebuthiuron	34014-18-1
MGK-264	113-48-4	Terbacil	5902-51-2
Mirex	2385-85-5	Terbufosa	13071-79-9
Molinate	2212-67-1	Terbutryn (Igran)	886-50-0
Monocrotophos	6923-22-4	2,3,4,5-Tetrachlorophenol	4901-51-3

Appendix: II Pesticides

Name	CAS
Nabam	142-59-6
Thionazina,b (Zinophos)	297-97-2
2,3,4,6-Tetrachlorophenol	58-90-2
Tetraethyl pyrophosphate (TEPP)d	107-49-3
Thiram	137-26-8
Tokuthionb (Prothiofos)	34643-46-4
Toxaphene	8001-35-2
Triademefon	43121-43-3
Triallate	2303-17-5
Trichlorfona	52-68-6
Trichloronateb	327-98-0
2,4,5-Trichlorophenol	95-95-4
2,4,6-Trichlorophenol	88-06-2
Triclopyr (Garlon)	55335-06-3
Tricyclazole	41814-78-2
Trifluralin (Treflan)	1582-09-8
Tri-o-cresyl phosphatea,d (TOCP)	78-30-8
Vernolate	1929-77-7
ZAC	--
Zineb	12122-67-7
Ziram	137-30-4

Appendix III: Antineoplastic Agents

Drug	Drug	Drug
Aldesleukin	Floxuridine	Nilutamide
Alemtuzumab	Fludarabine	Oxaliplatin
Altretamine	Fluorouracil	Paclitaxel
Amsacrine	Flutamide	Pegaspargase
Anastrozole	Fulvestrant	Pentostatin
Arsenic trioxide	Gemcitabine	Perphosphamide
Asparaginase	Gemtuzumab ozogamicin	Pipobroman
Azacitidine	Goserelin	Piritrexim isethionate
Bexarotene	Hydroxyurea	Plicamycin
Bicalutamide	Ibritumomab tiuxetan	Prednimustine
Bleomycin	Idarubicin	Procarbazine
Busulfan	Ifosfamide	Raltitrexed
Capecitabine	Imatinib mesylate	Streptozocin
Carboplatin	Interferon alfa-2a	Tamoxifen*
Cardiotoxins	Interferon alfa-2b	Temozolomide
Carmustine	Interferon alfa-n1	Teniposide
Chlorambucil	Interferon alfa-n3	Testolactone
Cisplatin	Irinotecan HCl	Thioguanine
Cladribine	Leflunomide	Thiotepa
Cyclophosphamide	Letrozole	Topotecan
Cytarabine	Leuprolide acetate	Toremifene citrate
Dacarbazine	Lomustine	Tositumomab
Dactinomycin	Mechlorethamine	Triptorelin
Daunorubicin HCl	Megestrol	Uracil mustard
Denileukin	Melphalan	Valrubicin
Docetaxel	Mercaptopurine	Vinblastine sulfate
Doxorubicin	Methotrexate	Vincristine sulfate
Epirubicin	Mitomycin	Vindesine
Estramustine phosphate sodium	Mitotane	Vinorelbine tartrate
Etoposide	Mitoxantrone HCl	
Exemestane		

Appendix IV: Restricted Chemicals

Chemical Name	Chemical Name
A	Dinitroglycerine [glycerol dinitrate].
Acetylides of heavy metals.	Dinitrophenol.
Aluminum ophorite explosive.	Dinitrophenolates.
Amatex.	Dinitrophenyl hydrazine.
Amatol.	Dinitroresorcinol.
Ammonal.	Dinitrotoluene-sodium nitrate explosive mixtures.
*Ammonium nitrate explosive mixtures (cap sensitive).	DIPAM [dipicramide; diaminohexanitrobiphenyl].
*Ammonium nitrate explosive mixtures (non-cap sensitive).	Dipicryl sulfone.
Ammonium perchlorate	Dipicrylamine.
Ammonium picrate [picrate of ammonia, Explosive D].	Display fireworks.
Ammonium salt lattice with isomorphously substituted inorganic salts.	DNPA [2,2-dinitropropyl acrylate].
*ANFO [ammonium nitrate-fuel oil].	DNPD [dinitropentano nitrile].
Azide explosives.	E
B	EDDN [ethylene diamine dinitrate].
Baranol.	EDNA [ethylenedinitramine].
Baratol.	Ednatol.
BEAF [1, 2-bis (2, 2-difluoro-2-nitroacetoxyethane)].	EDNP [ethyl 4,4-dinitropentanoate].
Blasting powder.	EGDN [ethylene glycol dinitrate].
BTNEC [bis (trinitroethyl) carbonate].	Erythritol tetranitrate explosives.
BTNEN [bis (trinitroethyl) nitramine].	Ethyl-tetryl.
BTTN [1,2,4 butanetriol trinitrate].	F
Butyl tetryl.	Flash powder.
C	Fulminate of mercury.
Calcium nitrate explosive mixture.	Fulminate of silver.
Cellulose hexanitrate explosive mixture.	Fulminating gold.
Copper acetylide.	Fulminating mercury.
Cyanuric triazide.	Fulminating platinum.
Cyclonite [RDX].	Fulminating silver.
Cyclotetramethylenetetranitramine [HMX].	G
Cyclotol.	Gelatinized nitrocellulose.
Cyclotrimethylenetrinitramine [RDX].	
D	Gem-dinitro aliphatic explosive mixtures.
DATB [diaminotrinitrobenzene].	Guanyl nitrosamino guanyl tetrazene.
DDNP [diazodinitrophenol].	Guanyl nitrosamino guanylidene hydrazine.
DEGDN [diethyleneglycol dinitrate].	Guncotton.
Dimethylol dimethyl methane dinitrate composition.	H
Dinitroethyleneurea.	Hexanite.

Appendix IV: Restricted Chemicals

Chemical Name	Chemical Name
Hexanitrodiphenylamine.	Nitrated polyhydric alcohol explosives.
Hexanitrostilbene.	Nitric acid explosive mixtures.
Hexogen [RDX].	Nitro aromatic explosive mixtures.
Hexogene or octogene and a nitrated N-methylaniline.	Nitrogelatin explosive.
Hexolites.	Nitrogen trichloride.
HMTD [hexamethylenetriperoxidediamine].	Nitrogen tri-iodide.
HMX [cyclo-1,3,5,7-tetramethylene 2,4,6,8-tetranitramine; Octogen].	Nitroglycerine [NG, RNG, nitro, glyceryl trinitrate, trinitroglycerine].
Hydrazinium nitrate/hydrazine/aluminum explosive system.	Nitroglycide.
Hydrazoic acid.	Nitroglycol [ethylene glycol dinitrate, EGDN].
	Nitroguanidine explosives.
K	Nitronium perchlorate propellant mixtures.
KDNBF [potassium dinitrobenzo-furoxane].	Nitrourea.
L	O
Lead azide.	Octogen [HMX].
Lead mannite.	Octol [75 percent HMX, 25 percent TNT].
Lead mononitroresorcinate.	P
Lead picrate.	PBX [plastic bonded explosives].
Lead salts, explosive.	Pentolite.
Lead styphnate [styphnate of Pb, Pb trinitroresorcinate]	Perchlorate explosive mixtures.
Liquid nitrated polyol and trimethylolethane.	Perchloric acid (conc.)
M	Peroxide forming chemicals
	PETN [nitropentaerythrite, pentaerythrite tetranitrate, pentaerythritol
Magnesium ophorite explosives.	Picramic acid and its salts.
Mannitol hexanitrate.	Picramide.
MDNP [methyl 4,4-dinitropentanoate].	Picrate explosives.
MEAN [monoethanolamine nitrate].	Picratol.
Mercuric fulminate.	Picric acid
Mercury oxalate.	Picryl chloride.
Mercury tartrate.	Picryl fluoride.
Metriol trinitrate.	PLX [95% nitromethane, 5% ethylenediamine].
Minol-2 [40% TNT, 40% ammonium nitrate, 20% aluminum nitrate]	Polynitro aliphatic compounds.
MMAN [monomethylamine nitrate]; methylamine nitrate	Polyolpolynitrate-nitrocellulose explosive gels.
Mononitrotoluene-nitroglycerin mixture.	Potassium chlorate and lead sulfocyanate explosive.
N	Potassium nitrate explosive mixtures.
NIBTN [nitroisobutametriol trinitrate].	Potassium nitroaminotetrazole.
Nitrated carbohydrate explosive.	Pyrotechnic compositions.
Nitrated glucoside explosive.	PYX [2,6-bis(picrylamino)]-3,5-dinitropyridine.

Appendix IV: Restricted Chemicals

Chemical Name	Chemical Name
R	Tetryl [2,4,6 tetranitro-N-methylaniline].
RDX [cyclonite, hexogen, T4, cyclo-1,3,5,-trimethylene-2,4,6,-trinitramine; hexahydro-1,3,5-trinitro-S-triazine].	Tetrytol.
S	TMETN [trimethylolethane trinitrate].
Salts of organic amino sulfonic acid explosive mixture.	TNEF [trinitroethyl formal].
Silver acetylide.	TNEOC [trinitroethylorthocarbonate].
Silver azide.	TNEOF [trinitroethylorthoformate].
Silver fulminate.	TNT [trinitrotoluene, trotyl, trilit, triton].
Silver oxalate explosive mixtures.	Torpex.
Silver styphnate.	Tridite.
Silver tartrate explosive mixtures.	Trimethylol ethyl methane trinitrate composition.
Sodatol.	Trimethylolthane trinitrate-nitrocellulose.
Sodium amatol.	Trimonite.
Sodium azide explosive mixture.	Trinitroanisole.
Sodium dinitro-ortho-cresolate.	Trinitrobenzene.
Sodium nitrate explosive mixtures.	Trinitrobenzoic acid.
Sodium nitrate-potassium nitrate explosive mixture.	Trinitrocresol.
Sodium picramate.	Trinitro-meta-cresol.
Styphnic acid explosives.	Trinitronaphthalene.
Silver tetrazene	Trinitrophenetol.
T	Trinitrophenol.
Tacot [tetranitro-2,3,5,6-dibenzo- 1,3a,4,6a tetrazapentalene].	Trinitroresorcinol.
TATB [triaminotrinitrobenzene].	Tritonal.
TATP [triacetone triperoxide].	U
TEGDN [triethylene glycol dinitrate].	Urea nitrate.
Tetranitrocarbazole.	X
Tetrazene [tetracene, tetrazine, 1(5-tetrazolyl)-4-guanyl tetrazene hydrate].	Xanthamonic hydrophilic colloid explosive mixture.

Appendix IV: Restricted Chemicals

Pyrophoric chemicals	
Grignard Reagents: RMgX (R=alkyl, X=halogen)	Nonmetal hydrides: Diethylarsine, diethylphosphine
Metal alkyls and aryls: Alkyl lithium compounds; tert-butyl lithium	Non-metal alkyls: R ₃ B, R ₃ P, R ₃ As; tetramethyl silane, tributyl phosphine
Metal carbonyls: Lithium carbonyl, nickel tetracarbonyl	Phosphorus
Metal powders (finely divided): Cobalt, iron, zinc, zirconium	Potassium
Metal hydrides: Sodium hydride	

Poison gases	
Name	Name
Arsine	Methyl bromide
Boron trichloride	Methyl mercaptan
Boron trifluoride	Methylchlorosilane
Bromine chloride	Hydrogen iodide
Carbon monoxide	Hydrogen selenide
Carbonyl fluoride	Hydrogen sulfide
Carbonyl sulfide	Nitrosyl chloride
Chlorine	Perchloryl fluoride
Chlorine pentafluoride	Phosgene
Cyanogen	Phosphine
Cyanogen chloride	Phosphorus pentafluoride
Diborane	Selenium hexafluoride
Dichlorosilane	Silicon tetrafluoride
Dinitrogen tetroxide	Stibine
Ethylene oxide	Sulfur dioxide
Fluorine	Sulfur tetrafluoride
Germane	Sulfuryl fluoride
Hexaethyl tetraphosphate	Tellurium hexafluoride
Hexafluoroacetone	Trifluoroacetyl chloride
Hydrogen bromide (RBS 3015)	Trifluorochloroethylene
Hydrogen chloride	Tungsten hexafluoride