



**The University of Texas
Health Science Center at Houston**

CHEMICAL PROTOCOL REVIEW

Prior to using certain chemical agents, Chemical Safety Committee (CSC) approval must be obtained. The principal investigator/laboratory supervisor is responsible for obtaining approval prior to the initiation of any procedure involving the referenced chemicals. The five step CSC Protocol Review process is as follows:

1. Determine if Chemical requires Chemical Safety Committee Review and Approval

The Chemical Safety Committee of the University of Texas Health Science Center at Houston (UTHSC-H) reviews any chemical agent listed in the ***Mandatory Protocol Review Chemical List***; however, any agent not found to be on the list may meet the criteria based on specific toxicological (LD₅₀, LC₅₀) data. The Mandatory Protocol Review Chemical List can be inspected online at anytime by visiting the Environmental Health and Safety web page (<http://www.uth.tmc.edu/safety/chemsafety/protocol/protocol.htm>). A protocol is required to be evaluated by the Chemical Safety Committee if it meets the following criteria:

A. Select Carcinogens

A select carcinogen is any substance which meets one of the following criteria:

- It is listed under Group 1 (“carcinogenic to humans”) or Group 2A (“probably carcinogenic to humans”) by the International Agency for Research on Cancer monographs (IARC); or
- It is listed under the category, “Known to be Human Carcinogens” in the Annual Report on Carcinogens published by the National Toxicology Program (NTP);

B. Select Agent Toxins and Other Biological Toxins

Select Agent Toxins are biological agent toxins that have the potential to pose a severe threat to public health and safety. The U.S. Centers for Disease Control and Prevention (CDC) and U.S. Department of Agriculture (USDA) oversee the National Select Agent Registry program.

C. Pesticides

A pesticide is defined as “any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest” by the Federal Insecticide, Fungicide, and Rodenticide Act. The U.S. Environmental Protection Agency oversees the regulation of pesticides.



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D. Explosives/Pyrophoric chemicals

An explosive is defined as “any chemical compound, mixture, or device which is designed to function by explosion that is substantially instantaneous with the release of gas and heat” by the U.S. Department of Transportation. Explosives are regulated by the Bureau of Alcohol, Tobacco, Firearms, and Explosives.

"Pyrophoric" means a chemical that will ignite spontaneously in air at a temperature of 130 °F (54.4 °C) or below, as defined by OSHA (29 CFR 1910.1200(c)).

E. Poison Gases

Gases that are known to be poisonous by inhalation listed under Class 2.3 of US DOT Hazardous Materials Table

F. Antineoplastic Agents

Antineoplastic agents are chemotherapeutic agents that control or kill cancer cells, as defined by NIOSH.

G. Highly Toxic

Chemical agents that are classified as “highly toxic” are substances which have a high degree of acute toxicity. Such agents meet the following criteria:

- Chemical has a median lethal dose (LD₅₀) of 50 milligrams or less when administered orally to rats [**LD₅₀ < 50 mg/kg**]; or
- Chemical has a median lethal dose (LD₅₀) of 200 milligrams or less when administered by continuous dermal contact for 24 hours (or less if death occurs within 24 hours) to the skin of rabbits [**LD₅₀ < 200 mg/kg**]; or
- Chemical has a median lethal concentration (LC₅₀) in air of 200 parts per million by volume when administered by continuous inhalation for one hour (or less if death occurs within one hour) to rats [**LC₅₀ < 200 ppm**]

H. Nanoparticles

Agent is classified as measuring in the nanoscale (1-100 nanometers) or research that utilizes nanoparticles or nanochemistry.



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Note: *Chemical Safety Committee may require review of other highly hazardous chemicals that do not fall under any of these categories mentioned above. Please contact Chemical Safety Program at 713-500-5832 for assistance or to verify if a specific chemical agent meets CSC review requirement.*

2. Completion of the form titled “Application for the Use of a Highly Toxic/Physically Dangerous Chemical and Exposure Assessment Form”

If a chemical requires committee review, then an “Application for the Use of a Highly Toxic/Physically Dangerous Chemical and Exposure Assessment Form” must be completed and submitted to the office of Environmental Health & Safety. This form can be completed online, manually, or the chemical safety staff can assist you completing the form in conjunction with a consultation.

3. Submission and approval by the Chemical Safety Committee

Once the appropriate forms are completed and submitted, the Chemical Safety Program evaluates the protocol based on the criteria included in the “Application for the Use of a Highly Toxic/Physically Dangerous Chemical and Exposure Assessment Form”. The Chemical Safety Committee 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 recommendations are adhered to during the protocol.

The UTHSC-H Chemical Safety Committee has streamlined the review process for certain common, specific chemicals that meet the above review criteria. These “Conditionally exempt chemicals” are common chemicals used in similar processes reviewed and approved by the Committee in the past. Individual Fact Sheets with information on the specific hazards, safety practices that must be followed while working with these chemicals, are created by the Chemical Safety program. When protocols involving these chemicals subsequently come up for review, instead of a full review and approval process, these Facts Sheets are provided to the Principal Investigators (PI) with the Memorandum of Understanding and Agreement in which the PI’s acknowledge the receipt and agree to follow the instructions on the Fact Sheets.

The Chemical Safety Committee meets the fourth Thursday of every odd month.



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4. Completion of a “Memorandum of Understanding and Agreement (MUA) for the Use of Chemical Agents”

Once Chemical Safety Committee approval is granted, then a “Memorandum of Understanding and Agreement (MUA) for The Use of Chemical Agents” is completed. This MUA requires obtaining signatures from the Chemical Safety Committee Chair, an Environmental Health and Safety representative, and the Principal Investigator.

5. Renewal of approved protocols

All approved protocols go through a limited review and renewal process annually. A complete review and renewal process is required for all active protocols every five years.

Mandatory Protocol Review Chemicals List

Appendix I: Carcinogens

CAS No	Agent	CAS No	Agent
000079-06-1	Acrylamide*	013909-09-6	1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea (Methyl-CCNU, Semustine)
023214-92-8	Adriamycin	000095-69-2	4-Chloro-ortho-toluidine
001402-68-2	Aflatoxins (naturally occurring mixtures of)	054749-90-5	Chlorozotocin
000092-67-1	4-Aminobiphenyl		Chromium [VI]
	Androgenic (anabolic) steroids	015663-27-1	Cisplatin
	Aristolochic acid	008001-58-9	Creosotes
007440-38-2	Arsenic and arsenic compounds	027208-37-3	Cyclopenta[cd]pyrene
001332-21-4	Asbestos	000050-18-0, 006055-19-2	Cyclophosphamide
000320-67-2	Azacitidine	079217-60-0	Cyclosporine
000446-86-6	Azathioprine	000053-70-3	Dibenz[a,h]anthracene
000071-43-2	Benzene	000191-30-0	Dibenzo[a,l]pyrene
000092-87-5	Benzidine	000056-53-1	Diethylstilboestrol
000050-32-8	Benzo[a]pyrene	000064-67-5	Diethyl sulfate
007440-41-7	Beryllium and beryllium compounds	000079-44-7	Dimethylcarbamoyl chloride
000494-03-1	N,N-Bis(2-chloroethyl)-2-naphthylamine (Chlornaphazine)	000540-73-8	1,2-Dimethylhydrazine
000542-88-1, 000107-30-2	Bis(chloromethyl)ether and chloromethyl methyl ether (technical-grade)	000077-78-1	Dimethyl sulfate
000154-93-8	Bischloroethyl nitrosourea (BCNU)	000106-89-8	Epichlorohydrin
000106-99-0	1,3-Butadiene	066733-21-9	Erionite
000055-98-1	1,4-Butanediol dimethanesulfonate (Busulphan, Myleran®)		Estrogens, nonsteroidal
007440-43-9	Cadmium and cadmium compounds		Estrogens, steroidal
002425-06-1	Captafol	000051-79-6	Ethyl carbamate (urethane)
000305-03-3	Chlorambucil	000106-93-4	Ethylene dibromide
000056-75-7	Chloramphenicol	000075-21-8	Ethylene oxide
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)	000759-73-9	N-Ethyl-N-nitrosourea
013010-47-4	1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea (CCNU)	033419-42-0	Etoposide



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CAS No	Agent	CAS No	Agent
033419-42-0	Etoposide in combination with cisplatin and bleomycin	000062-44-2	Phenacetin and analgesic mixtures containing
000050-00-0	Formaldehyde*	001336-36-3	Polychlorinated biphenyls
001303-00-0	Gallium arsenide	000366-70-1	Procarbazine hydrochloride
000556-52-5	Glycidol	014808-60-7	Silica, crystalline
022398-80-7	Indium phosphide	000096-09-3	Styrene-7,8-oxide
076180-96-6	IQ (2-Amino-3-methylimidazo[4,5-f]quinoline)	010540-29-1	Tamoxifen*
000148-82-3	Melphalan	029767-20-2	Teniposide
000484-20-8	5-Methoxypsoralen	001746-01-6	2,3,7,8-Tetrachlorodibenzo-para-dioxin
000101-14-4	Methylenebis(chloroaniline) (MOCA)	000127-18-4	Tetrachloroethylene
000066-27-3	Methyl methanesulfonate	000052-24-4	Thiotepa
000070-25-7	N-Methyl-N'-nitro-N-nitrosoguanidine (MNNG)	000095-53-4	ortho-Toluidine
000684-93-5	N-Methyl-N-nitrosourea	000299-75-2	Treosulfan
	MOPP and other combined chemotherapy including alkylating agents	000079-01-6	Trichloroethylene
000505-60-2	Mustard gas (Sulfur mustard)	000096-18-4	1,2,3-Trichloropropane
000091-59-8	2-Naphthylamine	000126-72-7	Tris(2,3-dibromopropyl) phosphate
	Nickel compounds	000051-79-6	Urethane (see Ethyl carbamate)
000051-75-2	Nitrogen mustard	000593-60-2	Vinyl bromide
016543-55-8, 064091-91-4	N'-Nitrosornicotine (NNN) and 4-(NNitrosomethylamino)-1-(3-pyridyl)-1-butanone (NNK)	000075-01-4	Vinyl chloride
000055-18-5	N-Nitrosodiethylamine	000075-02-5	Vinyl fluoride
000062-75-9	N-Nitrosodimethylamine		

* UTHSC-H Chemical Safety Committee "Conditionally exempt chemical"

Appendix II: Select Agent Toxins and Other Biological Toxins

Select Agent Toxins:

Abrin
Botulinum neurotoxins
<i>Clostridium perfringens</i> epsilon toxin
Conotoxins
Diacetoxyscirpenol
Ricin
Saxitoxin
Shiga-like ribosome inactivating proteins
Shigatoxin
Staphylococcal enterotoxins
T-2 toxin
Tetrodotoxin

Other Biological Toxins:

Cholera Toxin
Diphtheria Toxin
Pertussis Toxin

Appendix III: Pesticides

U.S. Environmental Protection Agency (EPA)

Compound	CAS No.	Compound	CAS No.
Abate (Temephos)	3383-96-13	Cycloate	1134-23-2
Acifluorfen	62476-59-9	2,4-D acid	94-75-7
Alachlor	15972-60-8	2,4-DB acid	94-82-6
Aldrin	309-00-2	DCPA (Dacthal)	2136-79-0
Ametryn	834-12-8	2,4'-DDD	53-19-0
Amoban	3566-10-7	4,4'-DDD	72-54-8
AOP	--	2,4'-DDE	3424-82-6
Asponb	3244-90-4	4,4'-DDE	72-55-9
Atraton	1610-17-9	2,4'-DDT	789-02-6
Atrazine	1912-24-9	4,4'-DDT	50-29-3
Azinphos-ethyla	2642-71-9	DEF (Butifos)	78-48-8
Azinphos ethyl (Ethyl guthion)	642-71-9	Demeton-O	298-02-3
Azinphos methyl (Guthion)	86-50-0	Demeton-Oc	8065-48-3
a-BHC	319-84-6	Demeton-S	126-75-0
β-BHC	319-85-7	Demeton-Sc	8065-48-3
?-BHC (Lindane)	58-89-9	Diallate	2303-16-4
d-BHC	319-86-8	Diazinon	333-41-5
Bendiocarb	22781-23-3	1,2-Dibromo-3-chloropropane (DBCP)	96-12-8
Benfluralin	1861-40-1	Dicamba	1918-00-9
Bolstar (Sulprofos)	35400-43-2	Dichlobenil (Casoron)	1194-65-6
Bromacil	314-40-9	3,5-Dichlorobenzoic acid	51-36-5
Bromoxynil (Brominal)	1689-84-5	Dichlorofenthiona	97-17-6
Busan 40	51026-28-9	Dichlorprop	120-36-5
Busan 85	128-03-0	Dichlorvos (DDVP)	62-73-7
Butachlor	23184-66-9	Diclofol (Kelthane)	115-32-2
Butylate	2008-41-5	Diclofop-methyl	51338-27-3
Carbophenothiona	786-19-6	Dicrotophosa	141-66-2
Captafol	2425-06-1	Dieldrin	60-57-1
Captan	133-06-2	Dimethoate	60-51-5
Carboxin	5234-68-5	Dinoseb	88-85-7
cis-Chlordane	5103-71-9	Dioxathion	78-34-2
trans-Chlordane	5103-74-2	Diphenamid	957-51-7
Chlordane -- not otherwise specified (n.o.s.)	57-74-9	Disulfoton (Disyston)	298-04-4
Chlorfenvinphosa	470-90-6	Disulfoton sulfone	2497-06-5
Chlorobenzilate	510-15-6	Disulfoton sulfoxidea	2497-07-6
Chlorpropham	101-21-3	Diuron	330-54-1
Chlorpyrifos	2921-88-2	Endosulfan I	959-98-8
Chlorpyrifos methyla	5598-13-0	Endosulfan II	33213-65-9
Chlorthalonil (Daconil)	1897-45-6	Endosulfan sulfate	1031-07-8
Coumaphos	56-72-4	Endrin	72-20-8
Crotoxyphosa	7700-17-6	Endrin aldehyde	7421-93-4
Cyanazine	21725-46-2	Endrin ketone	53494-70-5

Compound	CAS No.	Compound	CAS No.
EPN	2104-64-5	Nabam	142-59-6
Eptam (EPTC)	759-94-4	Naled	300-76-5
Ethalfuralin (Sonalan)	55283-68-6	Napropamide	15299-99-7
Ethion	563-12-2	Niacide	8011-66-3
Ethoprop	13194-48-4	4-Nitrophenol	100-02-7
Famphura	52-85-7	Norflurazon	27314-13-2
Fenamiphos	22224-92-6	Oxyfluorfen	42874-03-3
Fenarimol	60168-88-9	Parathion, ethyl	56-38-2
Fenitrothion	122-14-5	Parathion, methyl	298-00-0
Fensulfothion	115-90-2	Pebulate	1114-71-2
Fenthion	55-38-9	Pendimethalin	40487-42-1
Ferbam	14484-64-1	Pentachlorophenol (PCP)	87-86-5
Fluridone	59756-60-4	o-Phenylenediamine	95-54-5
Fonophsa	944-22-9	Phorate	298-02-2
Gardona (Tetrachlorvinphos)	961-11-5	Phosmet	732-11-6
Heptachlor	76-44-8	Phosphamidon	297-99-4
Heptachlor epoxide	1024-57-3	Phosphamidon	13171-21-6
Hexachlorobenzene	118-74-1	Picloram	1918-02-1
Hexachlorocyclopentadiene	77-47-4	Polyram	9006-42-2
Hexamethyl phosphoramidea (HMPA)	680-31-9	Profluralin	26399-36-0
Hexazinone	51235-04-2	Prometon (Pramitol 5p)	1610-18-0
Imidan (Phosmet)	732-11-6	Prometryn	7287-19-6
Ioxynil	1689-83-4	Pronamide (Kerb)	23950-58-5
Isodrin	465-73-6	Propachlor (Ramrod)	1918-16-7
KN Methyl	137-41-7	Propargite (S-181)	2312-35-8
Leptophos	21609-90-5	Propazine	139-40-2
Malathion	121-75-5	Propetamidophos	31218-83-4
Mancozeb	8018-01-7	Propham	122-42-9
Maneb	12427-38-1	Prosulfocarb	52888-80-9
MCPA acid	94-74-6	Ronnel	299-84-3
MCPP acid	7085-19-0	Silvex (2,4,5-TP)	93-76-5
Merphos	150-50-5	Simazine	122-34-9
Metalaxyl	57837-19-1	Simetryn	1014-70-6
Metham	137-42-8	Sodium dimethyldithiocarbamat	128-04-1
Methiocarb	2032-65-7	Stirophos (Tetrachlorvinphos, Gardona)	22248-79-9
Methoxychlor	72-43-5	Sulfotepp	3689-24-5
Methyl chlorpyrifos	5598-13-0	Sulprofos (Bolstar)	35400-43-2
Methyl paraoxon	311-45-5	2,4,5-T acid	94-82-6
Methyl paraoxon	950-35-6	2,4,5-TB	93-80-1
Methyl parathion	298-00-0	Tebuthiuron	34014-18-1
Metolachlor	51218-45-2	Terbacil	5902-51-2
Metribuzin	21087-64-9	Terbufosa	13071-79-9
Mevinphos	7786-34-7	Terbutryn (Igran)	886-50-0
MGK-264	113-48-4	2,3,4,5-Tetrachlorophenol	4901-51-3
Mirex	2385-85-5	2,3,4,6-Tetrachlorophenol	58-90-2
Molinate	2212-67-1	Tetraethyl pyrophosphate (TEPP)d	107-49-3

Monocrotophos	6923-22-4	Thionazina,b (Zinophos)	297-97-2
Compound	CAS No.	Compound	CAS No.
Thiram	137-26-8	Triclopyr (Garlon)	55335-06-3
Tokuthionb (Prothiofos)	34643-46-4	Tricyclazole	41814-78-2
Toxaphene	8001-35-2	Trifluralin (Treflan)	1582-09-8
Triademefon	43121-43-3	Tri-o-cresyl phosphatea,d (TOCP)	78-30-8
Triallate	2303-17-5	Vernolate	1929-77-7
Trichlorfona	52-68-6	ZAC	--
Trichloronateb	327-98-0	Zineb	12122-67-7
2,4,5-Trichlorophenol	95-95-4	Ziram	137-30-4
2,4,6-Trichlorophenol	88-06-2		

Appendix IV: Explosives/Pyrophoric Chemicals

Bureau of Alcohol, Tobacco, Firearms, and Explosives

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

Mandatory Protocol Review Chemicals List

Fulminate of silver.	M
Fulminating gold.	Magnesium ophorite explosives.
Fulminating mercury.	Mannitol hexanitrate.
Fulminating platinum.	MDNP [methyl 4,4-dinitropentanoate].
Fulminating silver.	MEAN [monoethanolamine nitrate].
G	Mercuric fulminate.
Gelatinized nitrocellulose.	Mercury oxalate.
Gem-dinitro aliphatic explosive mixtures.	Mercury tartrate.
Guanyl nitrosamino guanyl tetrazene.	Metriol trinitrate.
Guanyl nitrosamino guanylidene hydrazine.	Minol-2 [40% TNT, 40% ammonium nitrate, 20% aluminum].
Guncotton.	MMAN [monomethylamine nitrate]; methylamine nitrate.
H	Mononitrotoluene-nitroglycerin mixture.
Hexanite.	N
Hexanitrodiphenylamine.	NIBTN [nitroisobutametrial trinitrate].
Hexanitrostilbene.	Nitrated carbohydrate explosive.
Hexogen [RDX].	Nitrated glucoside explosive.
Hexogene or octogene and a nitrated N-methylaniline.	Nitrated polyhydric alcohol explosives.
Hexolites.	Nitric acid explosive mixtures.
HMTD [hexamethylenetriperoxidediamine].	Nitro aromatic explosive mixtures.
HMX [cyclo-1,3,5,7-tetramethylene 2,4,6,8-tetranitramine; Octogen].	Nitrogelatin explosive.
Hydrazinium nitrate/hydrazine/aluminum explosive system.	Nitrogen trichloride.
Hydrazoic acid.	Nitrogen tri-iodide.
K	Nitroglycerine [NG, RNG, nitro, glyceryl trinitrate, trinitroglycerine].
KDNBF [potassium dinitrobenzo-furoxane].	
L	Nitroglycide.
Lead azide.	Nitroglycol [ethylene glycol dinitrate, EGDN].
Lead mannite.	Nitroguanidine explosives.
Lead mononitroresorcinate.	Nitronium perchlorate propellant mixtures.
Lead picrate.	Nitrourea.
Lead salts, explosive.	O
Lead styphnate [styphnate of Pb, Pb trinitroresorcinate].	Octogen [HMX].
Liquid nitrated polyol and trimethylolethane.	Octol [75 percent HMX, 25 percent TNT].

Mandatory Protocol Review Chemicals List

P	Silver tetrazene
PBX [plastic bonded explosives].	Sodatol.
Pentolite.	Sodium amatol.
Perchlorate explosive mixtures.	Sodium azide explosive mixture.
Peroxide forming chemicals	Sodium dinitro-ortho-cresolate.
PETN [nitropentaerythrite, pentaerythrite tetranitrate, pentaerythritol tetranitrate].	Sodium nitrate explosive mixtures.
Picramic acid and its salts.	Sodium nitrate-potassium nitrate explosive mixture.
Picramide.	Sodium picramate.
Picrate explosives.	Styphnic acid explosives.
	T
Picratol.	Tacot [tetranitro-2,3,5,6-dibenzo- 1,3a,4,6a tetrazapentalene].
Picric acid	TATB [triaminotrinitrobenzene].
Picryl chloride.	TATP [triacetonetriperoxide].
Picryl fluoride.	TEGDN [triethylene glycol dinitrate].
PLX [95% nitromethane, 5% ethylenediamine].	Tetranitrocarbazole.
Polynitro aliphatic compounds.	Tetrazene [tetracene, tetrazine, 1(5-tetrazolyl)-4-guanyl tetrazene hydrate].
Polyolpolynitrate-nitrocellulose explosive gels.	
Potassium chlorate and lead sulfocyanate explosive.	Tetryl [2,4,6 tetranitro-N-methylaniline].
Potassium nitrate explosive mixtures.	Tetrytol.
Potassium nitroaminotetrazole.	TMETN [trimethylolethane trinitrate].
Pyrotechnic compositions.	TNEF [trinitroethyl formal].
PYX [2,6-bis(picrylamino)]-3,5-dinitropyridine.	TNEOC [trinitroethylorthocarbonate].
	TNEOF [trinitroethylorthoformate].
R	
RDX [cyclonite, hexogen, T4, cyclo-1,3,5,-trimethylene-2,4,6,-trinitramine; hexahydro-1,3,5-trinitro-S-triazine].	TNT [trinitrotoluene, trotyl, trilitite, triton].
S	Torpex.
Salts of organic amino sulfonic acid explosive mixture.	Tridite.
Silver acetylde.	Trimethylol ethyl methane trinitrate composition.
Silver azide.	Trimethylolthane trinitrate-nitrocellulose.
Silver fulminate.	Trimonite.
Silver oxalate explosive mixtures.	Trinitroanisole.
Silver styphnate.	Trinitrobenzene.
Silver tartrate explosive mixtures.	Trinitrobenzoic acid.

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Trinitrocresol.	Tritonal.
Trinitro-meta-cresol.	U
Trinitronaphthalene.	Urea nitrate.
Trinitrophenetol.	X
Trinitrophenol.	Xanthomonas hydrophilic colloid explosive mixture.
Trinitroresorcinol.	

Pyrophoric Chemicals

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

Appendix: V - Compressed Poison Gases

Class 2.3 - USDOT Hazardous Materials Table 49CFR 172.101

Arsine	Hydrogen iodide
Boron trichloride	Hydrogen selenide
Boron trifluoride	Hydrogen sulfide
Bromine chloride	Methyl bromide
Carbon monoxide	Methyl mercaptan
Carbonyl fluoride	Methylchlorosilane
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	Trifluorochloroethylene
Hydrogen chloride	Tungsten hexafluoride

Appendix VI: 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*
Carmustine	Interferon alfa-2b	Temozolomide
Chlorambucil	Interferon alfa-n1	Teniposide
Cisplatin	Interferon alfa-n3	Testolactone
Cladribine	Irinotecan HCl	Thioguanine
Cyclophosphamide	Leflunomide	Thiotepa
Cytarabine	Letrozole	Topotecan
Dacarbazine	Leuprolide acetate	Toremifene citrate
Dactinomycin	Lomustine	Tositumomab
Daunorubicin HCl	Mechlorethamine	Triptorelin
Denileukin	Megestrol	Uracil mustard
Docetaxel	Melphalan	Valrubicin
Doxorubicin*	Mercaptopurine	Vinblastine sulfate
Epirubicin	Methotrexate	Vincristine sulfate
Estramustine phosphate sodium	Mitomycin	Vindesine
Etoposide	Mitotane	Vinorelbine tartrate
Exemestane	Mitoxantrone HCl	

* UTHSC-H Chemical Safety Committee “Conditionally exempt chemical”