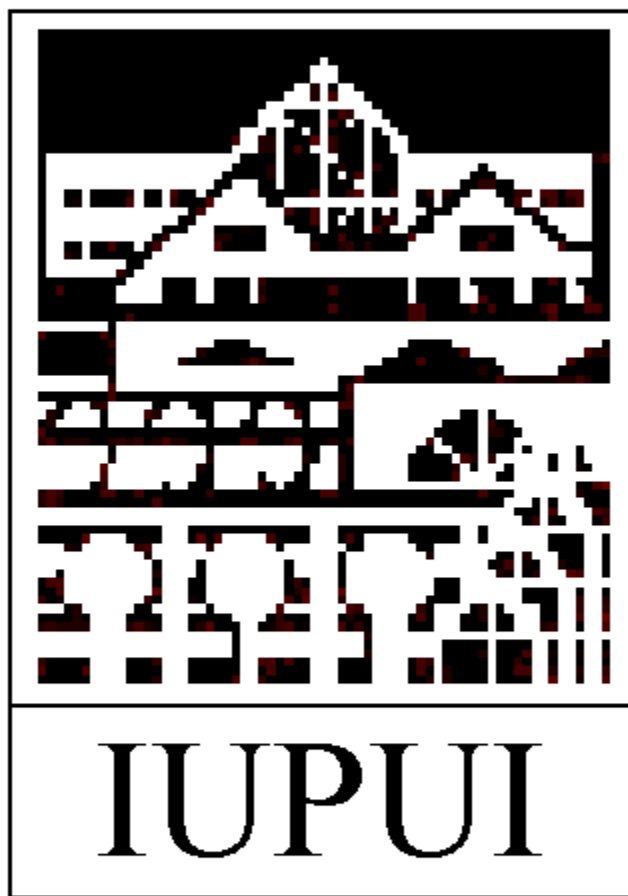

CHEMICAL MOVE GUIDELINES



**Indiana University - Purdue University
at Indianapolis**

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IUPUI CHEMICAL MOVE GUIDELINES



In years past, it was commonplace that a professor would stay in a given lab space for much, if not all, of their teaching/research career. As new facilities are constructed and as existing space undergoes renovation, lab staff are increasingly being asked to relocate their laboratory operations to other locations within the same building and frequently, to other campus buildings.

Over the past several years the Department of Environmental Health and Safety (EHS) in conjunction with other University laboratory operations have evaluated several options for accomplishing the move of stock chemicals. Moving contractors hired to move equipment and furniture are not licensed, trained or equipped to handle chemical materials. The number of companies capable of coordinating such a chemical move is limited. Past research has shown that the cost for using a private contractor is prohibitive in most cases.

Since August 1991, the University has accomplished the move of chemicals from several departments on campus, including the relocation of laboratory operations from the former 38th Street Campus, utilizing University resources and personnel. These moves have been accomplished both smoothly and safely.

The Department of Environmental Health and Safety has a vested interest in seeing that the movement of lab chemicals is completed in the safest manner possible. To assist in this endeavor, EHS has prepared these guidelines to assist lab staff in preparing for and completing the actual move of stock chemicals.

With advance notice and at no charge, EHS staff, vehicles and equipment can be made available to assist in moving stock chemicals from building to building. In addition, EHS staff may also assist, on a fee basis, in moving chemical inventories to new locations within the same building.

CLOSING OUT YOUR OLD LAB

Please remember that University workers and non-University contractors will be working in your vacated lab space. These workers are not familiar with the hazards of your chemicals and, equally important, how to protect themselves from the hazards of any chemicals left behind.

It remains the vacating department's responsibility to ensure that all chemical materials and other physical hazards (e.g., glassware, sharps waste, items with radiation warning labels, etc.) are removed from the lab. Under no circumstances should chemicals or chemical wastes be left in the lab unless prior arrangements have been made with EHS.



According to University policy, materials abandoned in laboratories will be removed by EHS staff at a cost to be charged back to the vacating lab or department.

ADVANCED NOTICE AND PREPARATION

EHS does require 30 days advance notice (as is required for the disposal of 50 individual containers or more of chemical waste) prior to any move involving a single lab. Large-scale moves, such as the relocation of multiple labs within a given department, require a significant amount of advanced training and detailed coordination. Ninety (90) days advanced notice will help ensure the move is conducted in a safe, efficient and timely manner.

MOVING WITHIN THE SAME BUILDING

Many chemical moves on campus involve the relocation of a single laboratory from one location to another within the same building. As such, outside assistance is not usually required or desired. In addition to the general safety guidelines and packaging guidelines described within this guidebook, please keep the following safety consideration in mind while moving your chemical inventory:

- Utilize a suitable cart when moving chemical products throughout the building. Past experience has shown that most accidental releases occur when staff drop chemical containers being moved by hand.
 - Pack breakable containers in boxes with separators to prevent breakage.
 - Always segregate chemicals by chemical compatibility. Incompatible materials should be boxed separately and moved in separate loads.
 - Avoid utilizing stairways when moving chemicals from floor-to-floor. Again, utilizing a suitable cart, transport the materials by means of a service elevator or in the absence of one, a passenger elevator.
 - Promptly report any chemical spill that may occur as outlined in the *IUPUI Staff and Faculty Emergency Procedures Handbook*.
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Safety is the first and foremost concern in accomplishing any chemical move. Please keep the following safety guidelines in mind as you prepare for your chemical move:

- **Safety Glasses or Goggles:** University policy mandates that all University personnel wear eye protection while handling hazardous materials.
- **Outer Garments:** Outer Garments should be worn while packaging, moving or otherwise handling chemicals, including at a minimum, a lab coat. Disposable lab coats are acceptable.
- **Emergency Procedures Refresher Training:** Provide a refresher training session on the *IUPUI Emergency Procedure Handbook* to all personnel involved in the chemical move. All chemical spills or releases must be reported as specified in the *IUPUI Emergency Procedures Handbook*.

- **Abandoned Chemicals:** Under no conditions are chemicals or chemical wastes to be left or abandoned in labs. Waste chemicals are to be referred to EHS as specified in these guidelines.
- **Furniture and Equipment Movers:** Each laboratory is responsible for maintaining a safe environment for contracted movers. Chemical containers must not be left in the open or unattended while movers are working within the lab.

- **Sound/Secure Chemical Containers:** Chemicals, whether stock or waste, must be in containers suitable for transportation. They must have screw or snap-on, tight-fitting, sealing lids.

Examples of unsuitable containers include flasks, beakers, bottles with ground glass or rubber stoppers or containers covered with parafilm. Materials in significantly corroded metal, cracked or crazed plastic or glass containers are to be transferred to sound containers



As a rule of thumb, replacement containers should be made of the same material as what the material was originally shipped.

- **Personal v.s. University Vehicles:** Under no circumstances should chemical, biological and radiological materials be transported in personal vehicles unless approved by EHS or the Radiation Safety Office.
- **Gas Cylinders (including lecture cylinders):** Compressed gasses present special hazards while being moved. For this reason, gas cylinders may need to be moved in a separate shipment. Ensure each cylinder (larger than a lecture cylinder) is equipped with a valve guard/cap.



Radioactive Materials: Due to the unique regulations governing their shipment and transportation, radioactive materials cannot be moved with stock chemicals. Contact the campus Radiation Safety Office at 274-4792 as soon as possible for additional guidance and assistance.

CHEMICAL WASTE

All chemical wastes are to be handled according to the *IUPUI Waste Disposal Guidelines* prepared and distributed by EHS. At a minimum this includes:

- Manifest all waste chemicals on an appropriate (IUPUI, Clarian, Wishard or Indiana State Board of Health) "HAZARDOUS MATERIALS MANIFEST FOR INTRA CAMPUS TRANSPORTATION."
- All waste materials must be in non-leaking containers with tight-fitting lids. Each container must be labeled with the exact content of the container. If there is a mixture of different chemicals, the percentage of each chemical should be estimated. Labels can be obtained through Environmental Health and Safety.
- The materials are to be boxed and ready for pickup. Keep the materials grouped according to the manifest. Place only a single layer of containers in each box. In the event multiple boxes are required, sequentially number the boxes and mark the corresponding manifest with the appropriate number.
- Contact the Department of Environmental Health and Safety at least 30 days in advance of any large-scale (50 containers or more) clean-out of waste chemicals or hazardous substances.

Waste Chemicals may be left in the vacated lab only under the following circumstances:

- *The items are manifested, properly labeled and ready for pickup*
and
- *The area can be adequately secured from general access*
and
- ***PRIOR ARRANGEMENTS HAVE BEEN MADE WITH ENVIRONMENTAL HEALTH & SAFETY BY CALLING 274-4351.***

MOVING TO A DIFFERENT CAMPUS BUILDING

With adequate notice and at no charge, EHS will provide comprehensive services (e.g., staffing, limited amounts of moving supplies and a vehicle) to assist in relocating chemical materials to a different campus building. As stated previously, EHS does require 30 days advance notice prior to the move for a single laboratory and 90 days notice for those moves involving multiple labs.

DEPARTMENTAL COORDINATION AND RESPONSIBILITIES

Each department will be responsible for designating the order each lab within that department will move. The Department Chairman or his designee will be responsible establishing the move priority. Materials must be segregated and ready to move on the moving date and time specified. Environmental Health and Safety staff will not be able wait for extended periods of time while labs segregate and box their materials.



————— *Each department is responsible for:* —————

- Designating a move coordinator to interact with other department staff and EHS.
- Obtaining their own moving supplies from the central supply area.
- Packing their chemicals as specified in these guidelines.
- Unpacking their chemicals at the laboratory.
- Returning the solvent boxes and plastic drums and pails to EHS staff or to a designated accumulation area.

GETTING STARTED

The following supplies will typically be utilized to facilitate a chemical move.

- 4 x 4 liters compartmentalized boxes (provided by EHS)
- 20 gallon polyethylene drums w/sealable screw tops (provided by EHS)
- 1 and 5-gallon pails with snap lids (provided by EHS)
- Small moving boxes
- Label tape and tape guns
- Moving labels
- Shredded paper to serve as packing material
- Marking pens

CHEMICALS OF SPECIAL CONCERN

A complete chemical inventory is necessary to maintain compliance with the Occupational Safety and Health Administration's Lab Safety Standard. The chemical inventory must be compared with the list of chemicals specified in Attachment A. Contact EHS at 274-4351 at least 10 days prior to the move in the event that you identify any of the chemicals in Attachment A in your inventory. Special arrangements will likely be required for these materials.

EXPLOSIVE MATERIALS

Contact EHS at 274-4351 if you discover any material that may be explosive due to exposure to heat, light, friction or shock. These include but are not limited to:

● **Peroxidizable chemicals:**

- cumene -cyclohexane -cyclopentane -diethyl ether -diisopropyl ether
- dioxane
- divinylacetylene
- ethylene glycol ethers (cellosolve and glymes)
- furan -methyl, isobutyl ketone
- potassium amide -potassium metal
- sodium amide -tetrahydrofuran
- vinyl ethers
- vinylidene dichloride (1,1-dichloroethylene)

● **Polynitroaromatic compounds** such as picric acid.

- Any other chemical or compound that lab personnel suspect may form an explosive by-product due to decomposition or aging.

SPECIAL HANDLING NEEDS

Anticipate that it will, under normal circumstances, take anywhere from 1 to 2 hours to move each truckload of chemicals. Special arrangements should be made with EHS at 274-4351 for the move of temperature-sensitive materials that require special temperature considerations.

FROM THE OLD LAB...

Chemicals must be segregated utilizing the compatibility guidelines found in Attachment B. Once segregated, chemicals are to be boxed in the following manner:

LIQUIDS

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graph TD; LIQUIDS --> SOLVENTS; LIQUIDS --> CORROSIVES;
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SOLVENTS

- 500 ml, 1, 2 or 4 liter solvent bottles are to be boxed in the compartmentalized cardboard boxes. Multiple bottles of 1000 mls. or less may be placed in each compartment provided that packing material is placed between bottles.
- Multiple bottles of 500 ml or less may be placed in the 20-gallon plastic drums. Do not stack containers. Use packing materials as needed.

CORROSIVES

- 500 ml, 1, 2 or 4 liter solvent bottles are to be boxed in the compartmentalized cardboard boxes. Multiple bottles of 1000 mls. or less may be placed in each compartment provided that packing material is placed between bottles.
- Multiple bottles of 500 ml or less may be placed in the 20-gallon plastic drums. Do not stack containers. Use packing materials as needed.
- *Do not place acids and bases in the same box or plastic drum or in boxes or drums containing solvents or other poisonous materials.*

OXIDIZERS & ORGANIC PEROXIDES



Oxidizers, whether solid or liquid, may be placed in any of the available shipping containers. Oxidizers are to be boxed separately. Containers with oxidizers are to be clearly identified with labels provided by EHS.

WATER REACTIVES

Materials that may react violently with water such as sodium metal or phosphorus pentoxide and materials that, when in contact with water, generate toxic or noxious gases are to be packed only in 5-gallon plastic pails or 20-gallon plastic drums. Water reactive chemicals are to be boxed by separately. Containers with water reactive materials are to be clearly identified with labels provided by EHS.



MISCELLANEOUS POISONS

Dry materials that do not fit into any of the previous categories, including those of higher toxicity (HMIS rating of 3 or 4), are to be boxed separately. Under certain conditions these items may also need to be transported separately. For example, inorganic cyanides are to be boxed separately and can not be transported in the same load with acids or strong bases. Contact EHS for additional guidance.

- Ensure that all chemical materials are in non-leaking containers with tight-fitting lids.
- Place the dry materials in any suitable moving box no larger than 18 inches by 18 inches. Ensure the bottom of the box is secured with at least one strand of moving tape.
- Place a single layer of containers in each box.
- Fill the box until the containers are snug together but not overly tight.
- Utilize shredded paper as packing materials if needed.



...TO THE NEW LAB

Once packaged, staff from the Department of Environmental Health and Safety will assume responsibility for transporting the chemical materials from your lab to their new destination.

The chemicals will be transported directly to new laboratory. Please ensure that laboratory staff are available to receive the materials from EHS staff. Once in the lab, the 4-compartment boxes and plastic pails and drums are to be immediately unloaded and either returned to EHS staff or returned to a designated accumulation area.

Flammable solvents and concentrated acids and bases need to be immediately placed into an appropriate, designated storage cabinet.

FINAL THOUGHTS

Perhaps the most obvious lesson learned from past chemical moves is that multiple obstacles will likely arise that will influence the flow of the move. Expect delays. They are inevitable. However, through adequate preplanning and with the exercise of cooperation and patience, your chemical move can be completed safely and effectively.

Attachment A

Acetyl acetone peroxide	Forbidden
Acetyl benzoyl peroxide	Forbidden
Acetyl cyclohexanesulfonyl peroxide (<12% water)	Forbidden
Acetylene (liquid)	Forbidden
Acetylene silver nitrate	Forbidden
Acetyl peroxide	Forbidden
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Aluminum dross	Forbidden
Aluminum hydride	Flam. Solid
Aluminum phosphide	Flam. Solid
Ammonium azide	Forbidden
Ammonium bromate	Forbidden
Ammonium chlorate	Forbidden
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Ammonium fulminate	Forbidden
Ammonium nitrate – fuel oil mixture	Explosive A
Ammonium nitrite	Forbidden
Ammonium picrate, dry	Explosive A
Antimony sulfide and a chlorate, mixtures of	Forbidden
Arsenic sulfide and a chlorate, mixtures of	Forbidden
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Arsine	Poison A
Ascaridole	Forbidden
Azauarolic acid	Forbidden
3-Azido-1,2-propylene glycol dinitrate	Forbidden
5-Azido-1hydroxy tetrazole	Forbidden
Azidodithiocarbonic acid	Forbidden
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Azidoethyl nitrate	Forbidden
Azido guanidine picrate (dry)	Forbidden
Azido hydroxy tetrazole (Hg and Ag salts)	Forbidden
Azotetrazole (dry)	Forbidden
Barium styphnate, monohydrate	Explosive A
Benzene diazonium chloride (dry)	Forbidden
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Benzene diazonium nitrate (dry)	Forbidden
Benzene triozonide	Forbidden
Benzoxidiazoles (dry)	Forbidden
Benzoyl azide	Forbidden
Biphenyl triozonide	Forbidden
Black powder	Explosive A
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Bromine azide	Forbidden
4-Bromo-1,2-dinitrobenzene (unstable at 59 C)	Forbidden
Bromoacetone	Poison A
Bromosilane	Forbidden
1,2,4-Butanetriol trinitrate	Forbidden
tert-Butoxycarbonyl azide	Forbidden
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tert-Butyl hydroperoxide (>90% w/water)	Forbidden
tert-Butyl peroxyacetate	Forbidden
n-Butyl peroxydicarbonate	Forbidden
tert-Butyl peroxyisobutyrate	Forbidden

Cabazide	Forbidden
Calcium carbide	Flam. Solid
Calcium, metal	Flam. Solid
Calcium, metal, crystalline	Flam. Solid
Calcium phosphide	Flam. Solid
Calcium silicon (powder)	Flam. Solid
Cesium metal	Flam. Solid
Chlorine azide	Forbidden
Chlorine dioxide	Forbidden
Chloropicrin and methyl chloride mixture	Poison A
Chloroprene, uninhibited	Forbidden
Coke, hot	Forbidden
Copper acetylide	Forbidden
Copper amine azide	Forbidden
Copper tetramine nitrate	Forbidden
Cyanuric triazide	Forbidden
Cyclotetramethylene tetranitramine, dry	Forbidden
Cyclotetramethylene tetranitramine, wet	Explosive A
Cyclotetramethylene trinitramine	Explosive A
Di-(1-hydroxytetrazole) (dry)	Forbidden
Di-(1-naphthoyl) peroxide	Forbidden
2,2-Di-(4,4-di-tert-butylperoxycyclohexyl) propane	Forbidden
Diacetone alcohol peroxides	Forbidden
p-Diazobenzene	Forbidden
1,2-Diazidoethane	Forbidden
1,1'-Diazoaminonaphthalene	Forbidden
Diazoaminotetrazole (dry)	Forbidden
Diazodinitrophenol	Explosive A
Diazodinitrophenol (dry)	Forbidden
Diazodiphenylmethane	Forbidden
Diazonium nitrates (dry)	Forbidden
Diazonium perchlorates (dry)	Forbidden
1,3-Diazopropane	Forbidden
Dibenzyl peroxydicarbonate (>87% w/water)	Forbidden
Di-(beta-nitoxyethyl) ammonium nitrate	Forbidden
Dibromoacetylene	Forbidden
N,N'-Dichlorazodicarbonamide (salts of) (dry)	Forbidden
Dichloroacetylene	Forbidden
2,4-Dichlorobenzoyl peroxide (>75% w/water)	Forbidden
Diethanol nitrosamine dinitrate (dry)	Forbidden
Diethylene glycol dinitrate (see 173.51)	Forbidden
Diethylgold bromide	Forbidden
Diethyl peroxydicarbonate (>27% in solution)	Forbidden
1,8-Dihydroxy-2,4,5,7-tetranitroanthroquinone (chrysammic acid)	Forbidden
Düodoacetylene	Forbidden
Düisopropylbenzene hydroperoxide (>72% in solution)	Forbidden
2,5-Dimethyl-2,5-dihydroperoxy hexane (>82% w/water)	Forbidden

Dimethylhexane dihydroperoxide (dry)	Forbidden
1,4-dinitro-1,1,4,4-tetramethylolbutanetetranitrate (dry)	Forbidden
2,4-Dinitro-1,3,35-trimethylbenzene	Forbidden
1,3 Dinitro-4,5-dinitrosobenzene	Forbidden
1,3-dinitro-5,5-dimethyl hydaantoin	Forbidden
Dinitro-7,8-dimethylglycoluril (dry)	Forbidden
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1,2-Dinitroethane	Forbidden
1,1-Dinitroethane (dry)	Forbidden
Dinitroglycoluril	Forbidden
Dinitromethane	Forbidden
Dinitropropylene glycol	Forbidden
2,4-Dinitroresorcinol (heavy metal salts of) (dry)	Forbidden
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4,6-Dinitroresorcinol (heavy metal salts of) (dry)	Forbidden
3,5-Dinitrosalicylic acid (lead salt) (dry)	Forbidden
Dinitrosobenzylamidine and salts of (dry)	Forbidden
2,2 Dinitrostilbene	Forbidden
a,a'-Di-(nitroxy)methylether	Forbidden
1,9-dinitroxy pentamethylene-2,4,6,8-tetramine (dry)	Forbidden
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Diphosgene	Poison A
2,2-Di-(tert-butylperoxy) butane (<55% in solution)	Forbidden
Di-(tert-butylperoxy)phthalate (>55% in solution)	Forbidden
Ethanol amine dinitrate	Forbidden
Ethylene diamine diperchlorate	Forbidden
Ethylene glycol dinitrate	Forbidden
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Ethyl hydroperoxide (explodes above 100 C)	Forbidden
Ethyl Perchlorate	Forbidden
Fulminate of mercury (dry)	Forbidden
Fulminate of mercury (wet)	Explosive A
Fulminating gold	Forbidden
Fulminating mercury	Forbidden
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Fulminating platinum	Forbidden
Fulminating silver	Forbidden
Fulminic acid	Forbidden
Galactsan trinitrate	Forbidden
Germane	Poison A
Glycerol-1,3-dinitrate	Forbidden
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Glycerol-monogluconate trinitrate	Forbidden
Glycerol monolactate trinitrate	Forbidden
Guanyl nitrosamino guanylidene hydrazine	Explosive A
Guanyl nitrosamino guanylidene hydrazine (dry)	Forbidden
Guanyl nitrosamino guanyl tetrazene	Explosive A
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Guncotton	Explosive A
Hexamethylene triperoxide diamine (dry)	Forbidden
Hexamethylol benzene hexanitrate	Forbidden
2,2',4,4',6,6'-Hexanitro-3,3'-dihydroxyazobenzene (dry)	Forbidden
Hexanitroazoxy benzene	Forbidden
2,2',3',4,4',6'-Hexanitrodiphenylamine	Forbidden

2,2',3,4,4',6'-Hexanitrodiphenylether	Forbidden
N,N'-(hexanitrodiphenyl)ethylene dinitramine (dry)	Forbidden
Hexanitrodiphenyl urea	Forbidden
Hexanitroethane	Forbidden
Hexanitrooxanilide	Forbidden
Hydrazine azide	Forbidden
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Hydrazine chlorate	Forbidden
Hydrazine dicarbonic acid diazide	Forbidden
Hydrazine perchlorate	Forbidden
Hydrazine selenate	Forbidden
Hyracyanic acid	Poison A
Hydrocyanic acid (prussic), unstabilized	Forbidden
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Hydrogen selenide	Poison A
Hydroxyl amine iodide	Forbidden
Hyponitrous acid	Forbidden
Inositol hexanitrate (dry)	Forbidden
Inulin trinitrate (dry)	Forbidden
Iodine azide (dry)	Forbidden
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Iodoxy compounds (dry)	Forbidden
Iridium nitratopentamine iridium nitrate	Forbidden
Isothiocyanic acid	Forbidden
Lead azide (dry)	Forbidden
Lead mononitroresorcinatate (dry)	Forbidden
Lead picrate (dry)	Forbidden
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Lead styphnate (dry)	Forbidden
Lead trinitroresorcinatate	Explosive A
Lithium acetylide-ethylene diamine complex	Flam. Solid
Lithium aluminum hydride	Flam. Solid
Lithium borohydride	Flam. Solid
Lithium ferrosilicon	Flam. Solid
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Lithium hydride	Flam. Solid
Lithium hydride in fused solid form	Flam. Solid
Lithium metal	Flam. Solid
Lithium metal in cartridges	Flam. Solid
Lithium nitride	Flam. Solid
Lithium silicon	Flam. Solid
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Magnesium aluminum phosphide	Flam. Solid
Magnesium dross, wet or hot	Forbidden
Magnesium granules coated	Flam. Solid
Magnesium metal	Flam. Solid
Magnesium aluminum powder	Flam. Solid
Magnesium scrap	Flam. Solid
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Mannitan tetranitrate	Forbidden
Mercurous azide	Forbidden
Mercury acetylide	Forbidden
Mercury iodide aquabasic ammonobasic	Forbidden
Mercury nitride	Forbidden

Mercury oxycyanide	Forbidden
Metal salts of methyl nitramine (dry)	Forbidden
Methazoic acid	Forbidden
Methylamine dinitramine and dry salts there of	Forbidden
Methylamine nitroform	Forbidden
Methylamine perchlorate (dry)	Forbidden
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Methyldichlorosilane	Poison A
Methyleneglycoldinitrate	Forbidden
α-Methylglucoside tetranitrate	Forbidden
α-Methylglycerol trinitrate	Forbidden
Methyl isobutyl ketone peroxide (in soln. >9% O)	Forbidden
Methyl nitrate	Forbidden
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Methyl picric acid (heavy metal salts of)	Forbidden
Methyl trimethylol methane trinitrate	Forbidden
Monochloroacetone (unstablized)	Forbidden
Naphthalene diozonide	Forbidden
Naphthyl amineperchlorate	Forbidden
Nickel picrate	Forbidden
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Nitrated paper (unstabilized)	Forbidden
Nitrates of diazonium compounds	Forbidden
Nitric Oxide	Poison A
2-Nitro-2-methylpropanol nitrate	Forbidden
6-Nitro-4 diazotoluene-3-sulfonic acid (dry)	Forbidden
n-Nitroaniline	Forbidden
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m-Nitrobenzene diazonium perchlorate	Forbidden
Nitroethylene polymer	Forbidden
Nitroethylene nitrate	Forbidden
Nitrogen peroxide	Poison A
Nitrogen trichloride	Forbidden
Nitrogen triiodide	Forbidden
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Nitrogen triiodide monoamine	Forbidden
Nitroglycerin, liquid, desensitized	Explosive A
Nitroglycerin, liquid	Forbidden
Nitroguanidine, dry	Explosive A
Nitroguanidine nitrate	Forbidden
1-Nitro hydantoin	Forbidden
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Nitro isobutane triol trinitrate	Forbidden
Nitromannite	Explosive A
Nitromannite (dry)	Forbidden
N-nitro-N-methylglycolamide nitrate	Forbidden
m-Nitrophenyldinitro methane	Forbidden
Nitrosugars (dry)	Forbidden
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1,7-Octadiene-3,5-diyne-1,8-dimethoxy-9-octadecynoic acid	Forbidden
Pentaerythrite tetranitrate (dry)	Forbidden
Pentaerythrite tetranitrate (wet)	Explosive A
Pentanitroaniline (dry)	Forbidden
Perchloric acid >72%	Forbidden
Peroxyacetic acid >43% w/>6% hydrogen peroxide	Forbidden

m-phenylene diaminediperchlorate (dry)	Forbidden
Phosgene (diphosgene)	Poison A
Phosphine	Poison A
Phosphorous pentasulfide	Flam. Solid
Phosphorous sesquisulfide	Flam. Solid
Phosphorous, white or yellow, in water (or dry)	Flam. Solid
<hr/>	
Phosphorous (white or red) and a chlorate mixtures of	Forbidden
Picrate of ammonia	Explosive A
Picric acid, dry	Explosive A
Picric Acid, wet >10% water	Flam. Solid
Picric Acid, wet >10% water over 25 lbs	Explosive A
Potassium carbonyl	Forbidden
<hr/>	
Potassium, metal or metallic	Flam. Solid
Potassium, metal liquid alloy	Flam. Solid
Propionyl peroxide (>28% in solution)	Forbidden
Poyridine perchlorate	Forbidden
Rubidium metal	Flam. Solid
Selenium nitride	Forbidden
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Silver acetylide (dry)	Forbidden
Silver azide (dry)	Forbidden
Silver chlorite (dry)	Forbidden
Silver fulminate (dry)	Forbidden
Silver oxalate (dry)	Forbidden
Silver picrate (dry)	Forbidden
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Sodium aluminum hydride	Flam. Solid
Sodium amide	Flam. Solid
Sodium hydride	Flam. Solid
Sodium hydrosulfide, solid (>25% water of crystallisation)	Flam. Solid
Sodium, metal or metallic	Flam. Solid
Sodium, metal dispersion in organic solvent	Flam. Solid
<hr/>	
Sodium, metal liquid alloy	Flam. Solid
Sodium methylate, dry	Flam. Solid
Sodium phosphide	Flam. Solid
Sodium picryl peroxide	Forbidden
sodium potassium alloy (liquid)	Flam. Solid
Sodium potassium alloy (solid)	Flam. Solid
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Sodium tetranitride	Forbidden
Stannic phosphide	Flam. Solid
Sucrose octanitrate	Forbidden
Sulfur and chlorate, loose mixtures of	Forbidden
Tetraazido benzene quinone	Forbidden
Tetraethylammonium perchlorate (dry)	Flam. Solid
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Tetramethylene diperoxide dicarbamide n	Forbidden
Tetranitro diglycerin	Forbidden
2,3,4,6-Tetranitrophenol	Forbidden
2,3,4,6-Tetranitrophenyl methyl nitramine	Forbidden
2,3,4,6-Tetranitrophenylnitramine	Forbidden
Tetranitroesorcinol (dry)	Forbidden

2,3,5,6-Tetranitroso-1,4-dinitrobenzene	Forbidden
2,3,5,6-Tetranitroso nitrobenzene (dry)	Forbidden
Tetrazene (guanyl nitrosamino guanyl tetrazene)	Explosive A
Tetrazine (dry)	Forbidden
Tetrazoyl azide (dry)	Forbidden
Tetryl	Explosive A
Tri-(b-nitroxyethyl) ammonium nitrate	Forbidden
Trichloromethyl perchlorate	Forbidden
Triformoxime trinitrate	Forbidden
1,3,5-Trimethyl-2,4,6-trinitrobenzene	Forbidden
Trimethylene glycol diperchlorate	Forbidden
Trimethylol nitromethane trinitrate	Forbidden
2,4,6-Trinitro-1,3,5,-triazide benzene (dry)	Forbidden
2,4,6 Trinitro-1,3-diazobenzene	Forbidden
Trinitroacetic acid	Forbidden
Trinitroacetonitrile	Forbidden
Trinitroamine cobalt	Forbidden
Trinitrobenzene, dry	Explosive A
Trinitrobenzene, wet (>16 oz)	Explosive A
Trinitrobenzoic acid, dry	Explosive A
Trinitrobenzoic acid, wet (>25 lbs)	Explosive A
Trinitroethanol	Forbidden
Trinitroethylnitrate	Forbidden
1,3,5-Trinitronaphthalene	Forbidden
2,4,6-Trinitrophenyl guanidine (dry)	Forbidden
2,4,6-Trinitrophenyl nitramine	Forbidden
2,4,6-Trinitrophenyl trimethylol methyl nitramine trinitrate (dry)	Forbidden
Trinitroresorcinol	Explosive A
2,4,6-Trinitroso-3-methyl nitraminoanisole	Forbidden
Trinitrotetramine cobalt nitrate	Forbidden
Trinitrotoluene, dry	Explosive A
Trinitrotoluene, wet (>10 oz)	Explosive A
Tris,bis-bifluoroamino diethoxy propane	Forbidden
Urea nitrate, dry	Explosive A
Urea nitrate, wet (>25 lbs)	Explosive A
Water reactive solid, n.o.s	Flam. Solid
p-xylyl diazide	Forbidden
Zirconium hydride	Flam. Solid

ATTACHMENT B

GENERAL CHEMICAL COMPATIBILITY

CHEMICALS IN COLUMNS "A" AND SHOULD "B" SHOULD BE KEPT SEPARATED

A	B
ACIDS	BASES
ALKALI AND ALKALINE EARTH METALS: Carbides Hydrides Hydroxides Oxides Peroxides	Water Acids Halogenated organic compounds Oxidizing agents: Chromates, dichromates Halogens Halogenating agents Hydrogen peroxide and peroxides Nitric Acid, nitrates Perchlorates and chlorates Permanganates Persulfates
INORGANIC AZIDES	Acids Heavy metals and their salts Oxidizing agents
INORGANIC CYANIDES	Acids, strong bases
INORGANIC NITRATES	Acids Metals Nitrites Sulfur
INORGANIC NITRITES	Acids Oxidizing agents
INORGANIC SULFIDES	Acids
ORGANIC COMPOUNDS: Organic acyl halides Organic anhydrides Organic halogen compounds Organic nitro compounds	Oxidizing agents Bases Organic hydroxy compounds Bases Organic hydroxy compounds Aluminum metal Strong bases
POWDERED METALS	Acids Oxidizing agents

EXAMPLES OF SPECIFIC CHEMICAL INCOMPATIBILITIES

CHEMICALS IN COLUMNS "A" AND SHOULD "B" SHOULD BE KEPT SEPARATED

A	B
ACETYLENE AND MONOSUBSTITUTED ACETYLENE (R-C CH)	Halogens Group IB and IIB metals and their salts
AMMONIA AND AMMONIUM HYDROXIDE	Halogens Halogenating agents Silver Mercury
CARBON, ACTIVATED	Oxidizing agents
HYDROGEN PEROXIDE	Metals and their salts
NITRIC ACID	Metals Sulfuric acid Sulfides Nitrites and other reducing agents Chromic acid and chromates Permanganates
MERCURY AND ITS AMALGAMS	Ammonia and ammonium hydroxide
OXALIC ACID	Silver Mercury
PHOSPHORUS (YELLOW)	Oxygen Oxidizing agents Strong bases
PHOSPHORUS PENTOXIDE	Water Halogenating agents
SULFURIC ACID	Metals Chlorates Perchlorates Permanganates Nitric acid

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