

SAFETY FAX!

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Chemical Storage Classification Suggested Chemical Storage Pattern

Storage of laboratory chemicals presents an ongoing safety hazard for school science departments. There are many chemicals that are incompatible with each other. The common method of storing these products in alphabetical order sometimes results in incompatible neighbors. For example, storing strong oxidizing materials next to organic chemicals can present a hazard.

A possible solution is to separate chemicals into their organic and inorganic families and then to further divide the materials into related and compatible families. Below is a list of compatible families. On the next page you will find this family arrangement pictured as shelf areas in your chemical stores area. The pictured shelf arrangement will easily enable you to rearrange your inventory into a safer and more compatible environment.

Inorganic

1. Metals, Hydrides
2. Acetates, Halides, Iodides, Sulfates, Sulfites, Thiosulfates, phosphates, Halogens, Oxalates, Phthalates, Oleates
3. Amides, Nitrates (except Ammonium Nitrate), Nitrites, Azides
4. Hydroxides, Oxides, Silicates, Carbonates, Carbon
5. Sulfides, Selenides, Phosphides, Carbides, Nitrides
6. Chlorates, Bromates, Iodates, Chlorites, Hypochlorites, Perchlorates, Perchloric Acid, Peroxides, Hydrogen Peroxide
7. Arsenates, Cyanides, Cyanates
8. Borates, Chromates, Manganates, Permanganates, Molybdates, Vanadates
9. Acids (except Nitric) (Nitric Acid is isolated and stored by itself.)
10. Sulfur, Phosphorus, Arsenic, Phosphorus Pentoxide
11. Inorganic miscellaneous

Organic

1. Acids, Amino Acids, Anhydrides, Peracids
2. Alcohols, Glycols, Sugars, Amines, Amides, Imines, Imides
3. Hydrocarbons, Esters, Aldehydes, Oils
4. Ethers, Ketones, Ketenes, Halogenated Hydrocarbons, Ethylene Oxide
5. Epoxy Compounds, Isocyanates
6. Peroxides, Hydroperoxides, Azides
7. Sulfides, Polysulfides, Sulfoxides, Nitriles
8. Phenols, Cresols
9. Dyes, Stains, Indicators
10. Organic miscellaneous

Notes

- If you store volatile materials (ether, hydrocarbons, etc.) in a refrigerator, the refrigerator must be explosion-proof. The thermostat switch or light switch in a standard refrigerator may spark and set off the volatile fumes inside and thus cause an explosion.
- This list is not complete and is intended only to cover the materials possibly found in an average school situation. This is not the only method of arranging these materials and is only offered as a suggestion.

Flinn Compatible Chemical Family Codes

When you assign compatible chemical family data you may wish to use the system created by Flinn. The family designations are listed below and in more detail on the following pages. Family designations for individual chemicals are found in the individual chemical listings of this Catalog/Reference Manual.

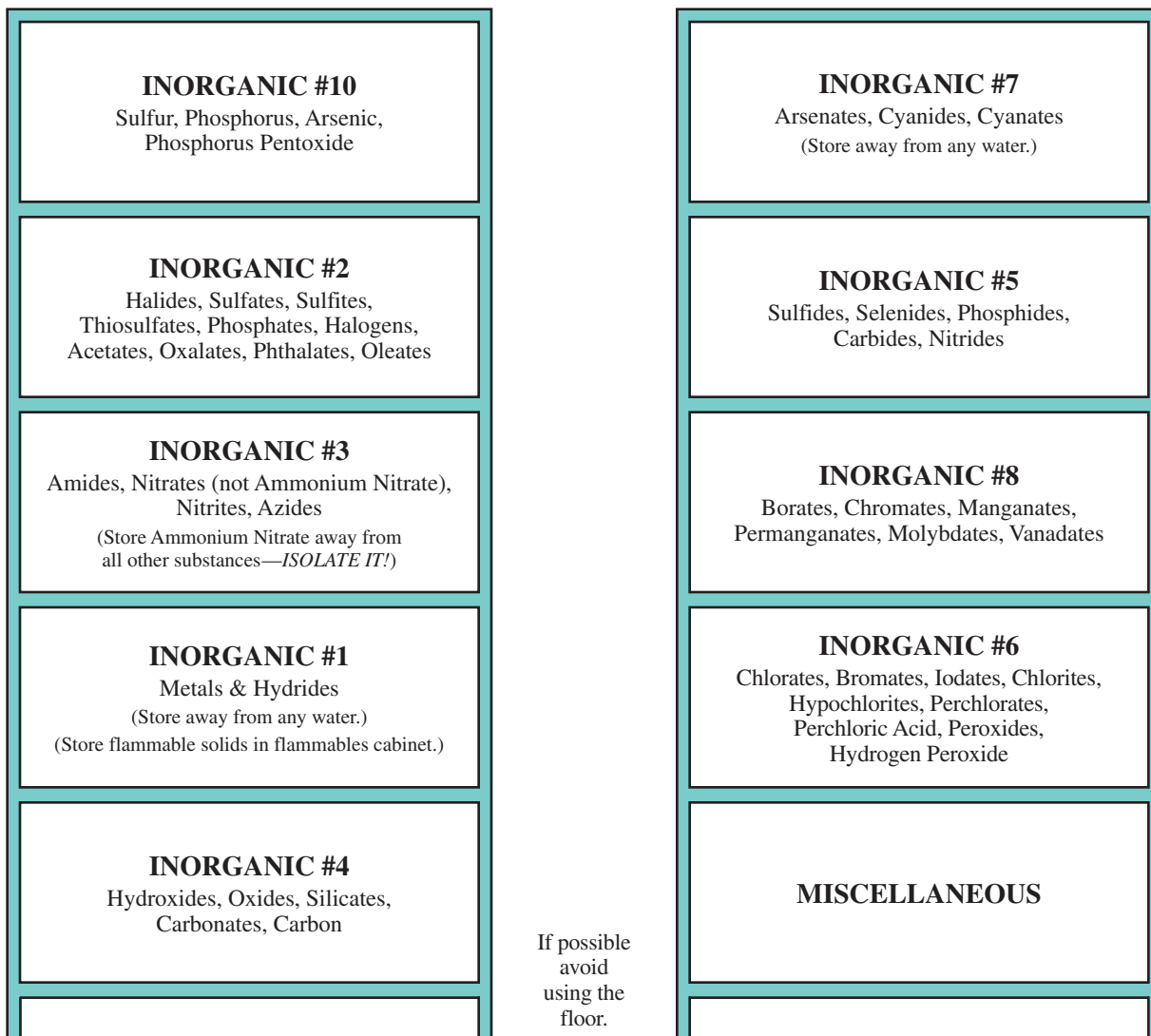
Flinn Inorganic Compatible Family Codes

- I1 – Metals, Hydrides
- I2 – Acetates, Halides, Iodides, Sulfates, Sulfites, Thiosulfates, Phosphates, Halogens
- I3 – Amides, Nitrates (except Ammonium Nitrate), Nitrites, Azides
- I4 – Hydroxides, Oxides, Silicates, Carbonates, Carbon
- I5 – Sulfides, Selenides, Phosphides, Carbides, Nitrides
- I6 – Chlorates, Bromates, Iodates, Chlorites, Hypochlorites, Perchlorates, Perchloric Acid, Peroxides, Hydrogen Peroxide
- I7 – Arsenates, Cyanides, Cyanates
- I8 – Borates, Chromates, Manganates, Permanganates
- I9 – Acids (except Nitric) Nitric Acid is isolated and stored by itself.)
- I10 – Sulfur, Phosphorus, Arsenic, Phosphorous Pentoxide
- IM – Miscellaneous

Flinn Organic Compatible Family Codes

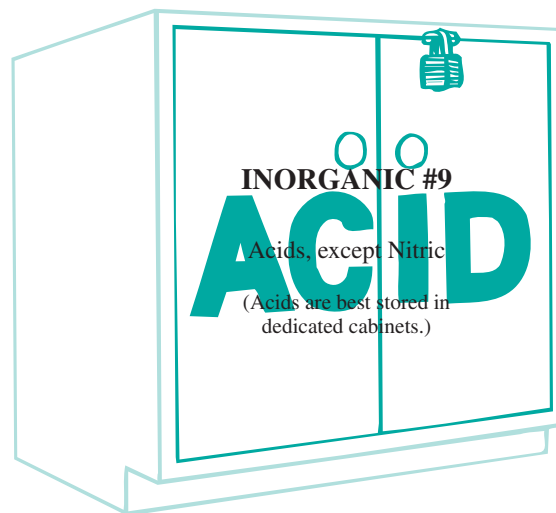
- O1 – Acids, Amino Acids, Anhydrides, Peracids
- O2 – Alcohols, Glycols, Sugars, Amines, Amides, Imines, Imides
- O3 – Hydrocarbons, Esters, Aldehydes, Oils
- O4 – Ethers, Ketones, Ketenes, Halogenated Hydrocarbons, Ethylene Oxide
- O5 – Epoxy Compounds, Isocyanates
- O6 – Peroxides, Hydroperoxides, Azides
- O7 – Sulfides, Polysulfides, Sulfoxides, Nitriles
- O8 – Phenols, Cresols
- O9 – Dyes, Stains, Indicators
- OM – Miscellaneous

SUGGESTED SHELF STORAGE PATTERN—INORGANIC



Storage Suggestions

1. Avoid storing chemicals on the floor (even temporarily).
2. No top shelf chemical storage.
3. No chemicals stored above eye level.
4. Shelf assemblies are firmly secured to walls. Avoid island shelf assemblies.
5. Provide anti-roll-off lips on all shelves.
6. Ideally, shelving assemblies would be of wood construction.
7. Avoid adjustable metal shelf supports and clips. Better to use fixed, wooden supports.
8. Store acids in a dedicated acid cabinet. Store nitric acid in the same cabinet **only** if isolated from other acids. Store both inorganic and some organic acids in the acid cabinet.
9. Store flammables in a dedicated flammables cabinet.
10. Store severe poisons in a dedicated poisons cabinet.
11. Maximize Storage Space. If shelf space is a problem, you are permitted to place more than one compatible chemical family on a shelf. Make sure you either have a physical divider or leave a 3" space between each family. This will maximize your tight shelf space while keeping each compatible chemical family separate from one another.



Store nitric acid away from other acids unless your acid cabinet provides a separate compartment for nitric acid.

SUGGESTED SHELF STORAGE PATTERN—ORGANIC

