SAFE USE OF PERCHLORIC ACID

Perchloric acid is a strong inorganic acid used for many purposes including the complete digestions of organic material. It is normally supplied in bottles of one gallon at 70-72% strength. Perchloric acid is oxidizing only at elevated temperatures (more than 150°C), but it is a corrosive at all temperatures. Perchloric acid presents an additional hazard in that mist and fumes can condense in ventilation systems to form metallic perchlorates that can be explosive. Anyone using perchloric acid should keep the following in mind.

Safety Tips

- Perchloric acid digestions of any size must be performed only in a fume hood. All perchloric acid digestions performed above room temperature (hot) require a special perchloric acid hood with a washdown system labeled “Perchloric Acid Hood Only - Organic Chemicals Prohibited” (special fume eradicators for small scale reactions can be obtained from GFS Chemicals at www.gfschemicals.com)
- Regardless of the size of the digestion, no organic solvents should be in the hood during the process
- Solvents must never be stored or used in a designated perchloric acid hood
- When diluting perchloric acid (or any other acid) always add acid to water, not the reverse
- Perchloric acid will attack human tissues as easily as it will attack samples of organic material. To prevent injury, goggles/face shield, gloves, and apron should be worn when handling
- Because of the potential for explosion, no repair or maintenance should be done on a hood used for perchloric acid digestions until it has been thoroughly washed
- Perchloric acid waste must not be mixed with any other waste after it is created. It should be put into acid-resistant bottles (such as the original acid container), clearly labeled, and treated as hazardous chemical waste (you can submit your waste pick up request at http://otp.ucop.edu/)
- Storage segregation:
  1. Perchloric acid should be stored with other acids, but in a separate tub from all other oxidizable acids (e.g. acetic acid)
  2. It may be stored in the same cabinet with other inorganic acids (hydrochloric, sulfuric, nitric acid…) if a secondary containment (Pyrex baking dish or plastic dish pan) is provided for spills
  3. Perchloric acid must not be stored near organic acids (acetic acid…) near bases, or near any other organic or flammable material
- If a spill occurs, contact EH&S during normal business hours or call 9-1-1

If you have any questions about safe use and handling of perchloric acid, or wish to have a fume hood approved for use with perchloric acid, call 827-5528. An excellent resource for information is a primary supplier of perchloric acid in the UCS, GFS Chemical www.gfschemicals.com/technicallibrary/Questions-About-Perchloric-Acid.asp.