

Piranha

Process:

Piranha for cleaning, etch and surface preparation.

Materials:

Sulphuric Acid (98% wt), and Hydrogen Peroxide (30% wt), mixed in a 4:1 ratio by volume.

Incompatible Materials:

No Solvents or other liquid organics, which often form explosives in Piranha. Use caution as other incompatibles exist. Watch for splattering and thermal 'run away' when etching metals, combustibles, or oxidizable materials. The first sign of a runaway is an unexpected increase in bubbling, whence you should remove your sample. Both Teflon and Pyrex beakers are suitable for use with Piranha.

Hazards:

Has many dangerous incompatibles. Highly destructive on contact with human tissues. Solution bubbles and produces irritating fumes from decomposition. Piranha heats considerably upon mixing and even more so during use, often to the point of boiling and occasionally to the point of splattering. Expect still further heating if mixing Piranha into a spent chemical accumulation bottle, and never tightly cap bottles as pressurization and explosion will occur.

Exposure Actions: Do what's below, and then notify CNM2 staff within a few hours. For advice, call CNM2 staff.

Eyes: Hold eyes open in running eyewash station for 15 minutes and call 911 as soon as possible.

Skin: Remove splashed clothing, wash for 15 minutes and seek medical aid if irritation persists.

Personal Protective Equipment:

Goggles, face shield, heavy chemical gloves (blue disposable Nitridex)¹, and heavy chemical apron. Piranha leaves invisible residues, so rinse gloves often.

Acceptable Locations For Use:

Wet process stations 2, 3, 8, 9, 11, 13, acid & base fume hood². If heated, only acid & base fume hood.

Additional Process Notes:

Reacts to form some Peroxymonosulphuric acid when mixed. To mix piranha, we recommend slowly pouring the Sulphuric Acid into the Hydrogen Peroxide. However, it's ok to mix in the reverse order as some institutions suggest, though expect some splattering if you do. The concentrations of chemicals provided by CNM2 allow either order of mixing. Measure water if necessary and slowly add Hydrogen Peroxide to water, then stir³. Heat only after mixing is complete if greater than ambient temperature is desired⁴. Never tightly cap bottles of spent Piranha, which risks explosion.

Disposal: Allow to cool, then decant or aspirate to neutralizer. Heavy metal bearing solutions should instead be disposed of in the "Transiently Oxidizing Acids" bottle⁵. Never tightly cap spent oxidizer bottles with non-venting caps. Instead, leave the cap ¼ to ½ turn from tight.

*Additional SOPs available, see: 1. PPE Choice and Cleaning
5. Haz Waste Management

2. Work Station Cleaning

3. Pouring and Mixing

4. Hotplates