Alternatives to Chromic/Sulfuric Acid for Cleaning Laboratory Glassware

SafetyNet #: 44

Regulations greatly restrict the disposal of chromic/sulfuric acid cleaning solutions due to their heavy metal content and low pH. Other disposal methods are not feasible because of the small amounts generated by laboratory operations.

EH&S encourages the use of substitutes for chromic/sulfuric acid. We recommend that users choose an alternative that:

- Removes desired contaminants from glassware.
- Is safe to handle, i.e., noncorrosive and nonirritating to skin and eyes.
- Does not qualify as a hazardous waste after use due to corrosivity (pH <2, pH >12.5) or heavy metals content.
- Is compatible with the containment device. Many concentrated acids (e.g., 60 percent sulfuric acid) will cause rapid destruction of high density polyethylene (Nalgene®). Check with the manufacturer for chemical resistance information.

Presented here are several commercially available substitutes used successfully on campus. Safety Data Sheets (SDSs) are required for each. Request an SDS from the vendor supplying the material or use the new ChemWatch Database [1].

When mixing any of the solutions listed below, remember:

- Reactions may give off considerable heat.
- Mix slowly in a fume hood.
- Wear goggles or a face shield.
- Cool solutions completely before capping the container.

Products Available from Primary Source Agreement Vendors:

**Fisher Scientific**, 999 Veteran’s Memorial Drive, Houston, TX 77038, Phone: (800) 766-7000 [2]

[1] ChemWatch Database
Versa-Clean Multipurpose Concentrate®
Catalog No. 04-342
Applications: Removes grease, clays, dirt, etc., from plastics, glass, rubber, vinyl and many other materials.

Products Available from Secondary Source Agreement Vendors:
VWR Scientific Products, P.O. Box 7900, San Francisco, CA, 94120, Phone (800) 932-5000 www.vwrsp.com [3]

RBS-35 Concentrate®
Catalog No. PI 27950
Applications: Surfactant cleaner excellent for the removal of radioactive isotopes; cleans glass, plastic, porcelain, or ferrous metal surfaces of grease, soil, and other contamination.

Additional Product Resources:
If the above products do not meet your needs, the following products may be ordered from the distributors listed below:

Sigma-Aldrich Chemical Co., P.O. Box 14508, St Louis, MO 63178, Phone: (800) 325-3010 www.sigmaaldrich.com [4]

Nochromix®
Catalog No. 328693
Applications: Prepared in the same way as chromic acid, this crystalline material contains no heavy metals and requires concentrated sulfuric acid.


Micro 90®
Catalog No. 9031
Applications: Removes trace organics and metals from glassware for fluorimetry analysis, atomic absorption, and high performance liquid chromatography.

ESPI, 1050 Benson Way, Ashland, OR 97520, Phone: (800) 638-2581 www.espimetals.com [6]

DeContam®
Catalog No. KC85D
Applications: Removes proteinaceous material from glassware used in tissue culture and enzymological analysis. Non-ionic surfactant detergent, pH 10.

Making Your Own Cleaner
The following product can be made from common laboratory chemicals.

Sodium Hydroxide (or Potassium Hydroxide)¹ in Alcohol

- Dissolve 120 g of sodium hydroxide (or potassium hydroxide) in 120 ml water. Allow to cool.
- Dilute to one liter with 95% ethyl alcohol. This solution acts as a general purpose cleaner.

¹ This solution should be prepared with caution.
References


Contact

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More information

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