

	<b>Chemical Substitutes</b>	Effective	January 25, 2006
		Originator	D. Taddeo
		Last Updated	January 25, 2006
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### Policy:

1. This policy provides a list of chemical substitutes for commonly used chemicals to promote a safer work environment.

### Scope

2. These procedures will apply to all faculty, staff and students at Ross University School of Veterinary Medicine.

### Procedure

3. This table outlines chemical substitutes for commonly used chemicals to promote a safer work environment.

Original Material	Substitute	Comments
Acetamide	Stearic Acid	In phase change and freezing point depression.
Benzene	Alcohol and Acetonitrile	no comment
Benzoyl peroxide	Lauryl peroxide	When used as a polymer catalyst.
Carbon Tetrachloride	Cyclo hexane; 1,1,1-trichloroethane; 1,1,2-trichchloro-trifluoroethane	In test for halide ions.
Formaldehyde	Peracetic acid	In cleaning of kidney dialysis machines.
Formaldehyde	"Formalernate" (Flinn Scientific)	For storage of biological specimens.
Formaldehyde	Ethanol	For storage of biological specimens.
Formalin	see Formaldehyde	no comment
Halogenated solvents	Non-halogenated solvents	In parts washers or other solvent processes.
Sodium dichromate	Sodium hypochlorite	no comment
Sulfide ion	Hydroxide ion	In analysis of heavy metals.

Toluene	Simple alcohols and ketones	no comment
Wood's metal	Onion's Fusible alloy	no comment
Xylene	Histo-Clear (National Diagnostics)	GRAS chemical, citrus odor, avoid strong oxidizing agents.
Fluorinert	Non-volatile, reusable pressurizing fluid	CS <sub>2</sub>
Carbon Tetrachloride	Isopropyl alcohol	no comment
Chloroform	Dichloromethane	no comment
Chromic acid	Potassium hydroxide	no comment
Chromic acid	Sonic baths, detergents	no comment
Sulfuric/chromic acids	Specialty detergents	no comment
Low BTU chlorinated solvents	High BTU non-chlorinated solvents	no comment
Chromic acid	PCC-54 detergent conc.	Good for cleaning pipettes and other lab equip. with hard-to-clean crevices and decontamination.
Chlorine containing detergents	PCC-Lite pH neutral detergent concentrate	Good for cleaning delicate instruments and glassware that is sensitive to alkaline and acidic cleaners. (pH of working solution 6.8-7.2)
Powerful lab cleaner	PCC Pluss Extra-strength detergent concentrate	Hard-to-remove residues, decontaminate surface and equipment radioactivity.
Phosphate-containing detergent	PCC-Pfree detergent concentrate	Permits long soaking and rinses free of residues, and can decontaminate radioactivity, similar to PCC-54.
Phosphate-containing extra-strength detergents	PCC-AP extra-strength, phosphate-free detergent concentrate	Use to handle worst lab cleaning problems.
S-35	P-33 (Du Pont)	Beta emission, half-life of 25 days, E <sub>max</sub> 0.25 MeV, specific activity of 3000 Ci/mmol. Compatible with the

		latest protocols for DNA Cycle Sequencing. No volatile components to contaminate work areas. Can reduce times for autoradiography with no effect on band resolution.
Ethidium Bromide	NAQ-Stain (Integrated Separation Systems, Enprotech)	Same sensitivity, non-carcinogenic, compatible with nylon and charged nylon membranes, completely reversible and will not interfere with subsequent detection steps.
Butyl or petroleum-containing cleaners	Super Brute Orange (Applied Research, Inc.)	Non-caustic, Non-butyl cleaner/degreaser. Water soluble, emulsifies tough grease, soil, sludge, ink, etc. For use on floors, machinery, etc., and is free rinsing.
Phenol/chloroform extractions	Strata Clean resin (Stratagene)	Non-toxic. Designed for extraction of restriction endonucleases.
Chlorine-containing solvents	Decontam (Electronic Space Products International-ESPI)	Non-toxic, non-flammable, removes oils and greases, tars, dried blood, distillation residues from most metals, plastics, glassware, quartz or fabric

For your information:

**Applied Research, Inc.** (1-800-253-3500)

**Enprotech** (1-800-433-6433)

**PCC brand** (1-800-874-3723)

**Stratagene** (1-800-424-5444)

**National Diagnostics** (1-800-526-3867)

**ESPI** (1-800-638-2581)