# McIndoe group glassware cleaning protocols

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## 1. Preliminary cleaning procedures:

1) Clean and dry glassware as soon as possible after your experiment is complete. Dirty glassware gets harder to clean over time.
2) Rinse glassware with appropriate solvents.
3) Scrub with a bottle brush to remove any adhered solids. Dispose of these in the appropriate waste container. Use a sonicator if scrubbing by hand is insufficient.
4) Thoroughly degrease all ground glass joints (use hexanes). Joints should be white and frosty/opaque, not transparent. Look in the oven for examples of clean joints.

## 2. Aggressive cleaning options:

** *Whenever working with the base bath or acid wear closed-toe footwear, a lab coat, safety glasses and thick rubber gloves* **

Before using the base or acid bath, glassware **must** be cleaned according to the procedures above. This will ensure faster cleaning, extend the life of the baths (the reagents to make one base bath cost ~$100) and reduce the accumulation of hazardous chemicals that we are all exposed to when we use these solutions.

### 2.1 Base bath usage:

Fully submerge glassware so it is free of air bubbles in the base bath. Leave for a few minutes. Rinse thoroughly with water. If it is still not clean, repeat the preliminary steps and leave in the base bath for an hour.

***** Anyone adding glassware to the base bath is responsible for removing it promptly ****

### 2.1.1 Glassware that should not be placed in the base bath:

- Anything with a glass frit. Base will eat away at the glass frit. To clean fritted glassware, use vacuum filtration, distilled water and acetone. Clean the frit gently with a kimwipe or a brush.

### 2.2 Nochromix (Acid solution):

1) Before using this solution, scrub all glassware with soapy water and rinse thoroughly with water. Organic solvent residues pose an explosion hazard because Nochromix is a potent oxidizer and excess soap may leave a greasy residue.
2) Obtain Nochromix solution from acids cupboard on west side of lab. Leave glassware in the acid solution for a few minutes or overnight.

## 3. Before placing glassware in the oven

1) Check all ground glass joints to ensure they are clean, and wipe with hexane-soaked paper towel if necessary.

2) Do not place wet glassware in the oven until the end of the day. If you are leaving early, leave the glassware in on your bench and ask another group member to place it in the oven.

## 4 Preparation of cleaning solutions

### 4.1 Base bath preparation:

Base baths require changing when the solution becomes black and/or when glassware is no longer being effectively cleaned.

*** Whenever working with the base bath wear proper footwear, a lab coat, safety glasses and thick rubber gloves ***

To change a base bath: empty the bath of all glassware, use a beaker to transfer the dirty solution from the bath to an empty 4L solvent container (you'll need two of these). DO NOT POUR DIRECTLY FROM THE BATH, there are holes in the rim of the bath container and you will spill dirty base bath everywhere. Clearly label the waste containers and mark them for waste pick up. Rinse out the bath container and add 500 g KOH. Fill the bath with 2 x 4 L bottles of 95% ethanol and stir with large glass rod until everything is dissolved (this may take a while). If not all of the KOH will dissolve, add a minimal amount of water until it does.

### 4.2 Nochromix preparation

- Prepare according to package directions (mix package of Nochromix into concentrated $H_2SO_4$) OR
- Add 19 g ammonium persulphate, $(NH_4)_2S_2O_8$, to 2 L $H_2SO_4$ [1]
- Solution will be colourless initially and turn orange as the oxidizer is consumed.

[1] H.M. Stahr, W. Hyde, and L. Siegler, **1982.** Oxidising Acid Baths - without Chromate Hazards. *Anal. Chem.* v.54 p.1452A