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## Warner TSP wash protocol

We have developed a cleaning procedure which easily and quickly cleans glassware and plastics such as acrylic, polystyrene, polycarbonate, and Delrin. The cleaning procedure is well optimized for removing all hydrophilic, as well as many moderately hydrophobic, materials. In field tests, plastics cleaned using this technique have been maintained in good working order for many years.

### Materials

- Sodium phosphate, tribasic ( $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$ )  
Make a 40-50 mM solution (~3 g per 200 ml – yes, you can estimate!)  
If you don't have the tribasic salt, then use the dibasic salt and pH to 12.5 using NaOH.
- Dilute HCl solution (0.1% by volume)  
I usually make 1 liter by adding 1 ml concentrated HCl to 1 liter  $\text{H}_2\text{O}$
- DD- $\text{H}_2\text{O}$  or nanopure water

### Method

The basic strategy is to do an initial rinse with nanopure  $\text{H}_2\text{O}$ , then do a cleaning step using the TSP solution. This is followed by a second  $\text{H}_2\text{O}$  rinse and any residual phosphate is removed by washing with the dilute HCl. Any remaining HCl is removed by doing a final rinse with the nanopure  $\text{H}_2\text{O}$ .

The TSP cleaning step can be performed by pressure washing with a squirt bottle, or by gently rubbing the surface with a soaked Q-tip or Kimwipe. The subsequent HCl and  $\text{H}_2\text{O}$  rinses do not greatly benefit from rubbing and only need a squirt bottle.