M0045	*Quality System Procedure* Office of the Texas State Chemist	Issue Date:	Rev.: *4*
Title: **Laboratory Glassware/ Plasticware Cleaning Procedures**			Page #: *1 of 12*

Prepared by: _____ Date: 02/20/2018

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Purpose

This standard operational procedure describes the various methods used to clean the glassware and plasticware in the laboratory. Specific methods of cleaning glassware and plasticware are required to prevent interference on an instrument and/or to prevent contamination in preparation of a samples for analyses.

Scope / Field of Application

This standard operational procedure applies to all glassware and plasticware that are cleaned in room 132 and 132A.

Responsibilities

Lab Attendants – required to follow this standard operational procedure, responsible for properly cleaning and returning the glassware/ plasticware to the labs.

Supervisor – ensure SOP is being followed.

Chemists – responsible for monitoring their glassware/ plasticware for possible contamination and for requesting any special needs for cleaning glassware/plasticware.

Procedure

Reagents:

Acetone

Ammonium hydroxide

Aquet Liquid Detergent

Bleach

Contrad NF Detergent

Dish Washing Liquid Soap (Palmolive, Dawn, or equivalent)

DeSCAL Detergent

Dri-Contrad Detergent

Methanol

Micro-90 Concentrated Cleaning Solution

Nitric Acid, Trace Metal Grade

Equipment:

National Automatic Glassware Washer

National Large Capacity Oven 75°C

National Large Capacity Oven 110°C

Deionized Water Purification System- Barnstead E-Pure

Deionized Water Purification System- PURELAB Ultra

Interferences and Troubleshooting:

If the resistivity reading on the Barnstead E-Pure deionized water (DI) purification system drops below 17 megaohms it can have an undesired effect on the laboratory results due to an increase in the amount of ions in the water. The filter cartridges should be changed as soon as the resistivity reading drops below 17.

Toxins/ BSL2 Glassware and Plasticware

Use acetone to remove any writing on the glassware. Rinse thoroughly with tap water, ensuring there are not any particles left on the glassware/ plasticware that may clog the washer or contaminate the soaking solution.

Cleaning Procedures Using the Glassware Washer:

Load in washer so that each piece will be washed and rinsed properly.

Select cycle #4 and start the washer.

The washer will flush and then it will fill up with water and pause. After the washer has paused, raise the door and add 350 ml of Dri-Contrad to the wash.

Close the washer door and press start on the control panel. After the wash cycle is complete run cycle #5 (DI water rinse).

Once the rinse cycle is complete, put the glassware in the appropriate oven. Put glassware in the 110°C oven and plasticware in the 75°C oven. Glassware that contains rubber seals (i.e. blender jars) should be dried in the 75°C oven.

Cleaning Procedures Using Bleach Bath:

The bleach baths are made up of a 3.3% Aquet liquid laboratory detergent and 5.0% bleach solution. To make a fresh bleach bath, add 2 L of Aquet Soap Concentrate and 3 L of bleach solution to the tub and fill with tap water to 60 L (or add 1 L of Aquet Soap Concentrate and 1.5 L of bleach solution to the tub and fill with tap water to 30 L).

Make sure the glassware and plasticware are completely submerged in the bath and allow it to soak for at least two hours.

Carefully remove the glassware and plasticware from the bath, and rinse at least three times with tap water, at least three times with RO water, and at least three times with DI water.

Put glassware in the 110°C oven and plasticware in the 75°C oven. Glassware that contains rubber seals (i.e. blender jars) should be dried in the 75°C oven.

Combustion/ Microscopy/ Drugs/ Vitamin A/ Calcium/ Sulfur/ Phosphate and P_2O_5 Gravimetric/ Chlorine and Salt

Use acetone to remove any writing on the glassware. Rinse thoroughly with tap water, ensuring there are not any particles left on the glassware/ plasticware that may clog the washer or contaminate the soaking solution.

Cleaning Procedures Using the Glassware Washer:

Load in washer, select cycle #3 (regular wash with10% Contrad NF detergent wash), and start the washer.

After the wash cycle is complete, allow the glassware to cool and put them in the appropriate oven. Put glassware in the 110°C oven and plasticware in the 75°C oven. Glassware that contains rubber seals (i.e. blender jars) should be dried in the 75°C oven.

Cleaning Procedures Using 10% Contrad NF Detergent Bath:

Safety: Put on personal protective equipment before working with the 10% Contrad NF bath. You should have on protective gloves and an apron or lab coat.

When the automatic washer is unavailable or the objects are too large to be washed effectively in the washer, the objects should be cleaned with the 10% Contrad NF detergent bath. To make a fresh 10% Contrad NF detergent bath, add 9 L of Contrad NF detergent and 81 L DI water.

Rinse the glassware as well as possible to avoid contamination of the 10% Contrad NF bath.

Make sure the glassware is completely submerged in the bath and allow it to soak for at least two hours.

Carefully remove the glassware from the bath, making sure not to splash the solution on you.

Rinse thoroughly with tap water (at least three times) followed by RO water (at least three times).

Put glassware in the 110°C oven and plasticware in the 75°C oven. Glassware that contains rubber seals (i.e. blender jars) should be dried in the 75°C oven.

AA, Trace Metals, and Fats

Use acetone to remove any writing on the glassware. Wash with dishwashing detergent and rinse thoroughly with tap water, ensuring there are not any particles left on the glassware/ plasticware that may clog the washer or contaminate the soaking solution.

Cleaning Procedures using the Glassware Washer:

Load in washer and select cycle #6 to start the washer.

The washer will flush and then it will fill up with water and pause.

After the washer has paused, raise the door and add 110 ml of DeSCAL to the wash.

Close the washer door and press start on the control panel.

After the wash cycle is complete, allow the glassware to cool and put them in the appropriate oven. Put glassware in the 110°C oven and plasticware in the 75°C oven. Glassware that contains rubber seals (i.e. blender jars) should be dried in the 75°C oven.

Cleaning Procedures Using 10% DeSCAL detergent Bath:

Safety: Put on protective equipment before working with the 10% DeSCAL bath. You should have on protective gloves and an apron or lab coat.

When the automatic washer is unavailable or the objects are too large to be washed effectively in the washer, clean with the 10% DeSCAL detergent bath. To make a fresh 10% DeSCAL detergent bath, add 3.5 L of DeSCAL detergent and fill with DI water to 35 L.

Rinse the glassware as well as possible to avoid contamination of the 10% DeSCAL bath.

Make sure the glassware is completely submerged in the bath and allow it to soak for at least two hours.

Carefully remove the glassware from the bath, making sure not to splash the solution on you.

Rinse thoroughly with DI water (at least three times).

Put glassware in the 110°C oven and plasticware in the 75°C oven. Glassware that contains rubber seals (i.e. blender jars) should be dried in the 75°C oven.

ICP and P_2O_5 ICP

Safety: Put on protective equipment before working with the 7% HNO_3 solution bath. You should have on protective gloves, a face shield and an apron or lab coat.

Use acetone to remove any writing on the glassware.

All glassware used on ICP methods must be cleaned using a 7% HNO_3 solution bath. To make a fresh 7% HNO_3 solution bath, add 2.5 L of HNO_3 and 31.5 L DI water. Only Trace Metal grade HNO_3 should be used when making the ICP acid bath.

Rinse the glassware as well as possible to avoid contamination of the 7% HNO_3 solution bath.

Make sure the glassware is completely submerged in the bath and allow it to soak for at least two hours.

Carefully remove the glassware from the bath, making sure not to splash the acidic solution on you.

Rinse thoroughly with DI water, the glassware can be rinsed by hand (at least three times) or by using cycle #5 (DI water rinse) on the washing machine.

Put glassware in the 110°C oven and plasticware in the 75°C oven. Glassware that contains rubber seals (i.e. blender jars) should be dried in the 75°C oven.

ICP-MS

Use acetone to remove any writing on the glassware.

Note: If glassware is for Lead in Milk Analysis by ICP-MS:

a. Rinse the sample from the glassware with tap water.

b. Rinse out 2 times with methanol to remove organic residue.

c. Rinse out 3 times with D.I. water.

d. Proceed to 1% HNO_3 solution bath.

Safety: Put on protective equipment before working with the 1% HNO_3 solution bath. You should have on protective gloves, a face shield and an apron or lab coat.

All glassware used on ICP-MS methods must be cleaned using a 1% HNO_3 solution bath. To make a fresh 1% HNO_3 solution bath, add 486 ml of HNO_3 and 33.5 L DI water. **Only Trace Metal grade HNO_3** should be used when making the ICP-MS acid bath.

Rinse the glassware as well as possible to avoid contamination of the 1% HNO_3 solution bath.

Make sure the glassware is completely submerged in the bath and allow it to soak for at least 24 hours.

Carefully remove the glassware from the bath, making sure not to splash the acidic solution on you.

Rinse thoroughly with DI water, the glassware must be rinsed by hand (at least three times).

Put glassware in the 110°C oven and plasticware in the 75°C oven. Glassware that contains rubber seals (i.e. blender jars) should be dried in the 75°C oven.

LCMS and Dioxin

Use acetone to remove any writing on the glassware.

Rinse and wash out the glassware with DI water a minimum of three times.

If the glassware has residue, use a brush and liquid dish washing detergent (Palmolive or equivalents) to remove the residue. Then rinse again with DI water.

After rinsing with DI water, rinse once with methanol.

Allow to air dry

Glass Pipette Bath for AA and Trace Metals

The pipette baths are made up of a 10% DeSCAL solution. To make a fresh pipette bath, add 1.5L of DeSCAL detergent and 13.5 L of DI water to the bath.

Make sure the glassware is completely submerged in the bath and allow it to soak for at least two hours.

Carefully remove the glassware from the bath, making sure not to splash the solution on you.

Use the pipette washer to rinse the pipettes at least three times with DI water.

Put the pipettes in the 110°C oven to dry.

Glass Pipette Bath for Vitamin A, Sulfur, Phosphate, and P_2O_5 Gravimetric

The particular pipette baths are made with 14.0 L of RO water with 280ml Micro-90 cleaning solution.

Make sure the glassware is completely submerged in the bath and allow it to soak for at least two hours.

Carefully remove the glassware from the bath, making sure not to splash the solution on you.

Use the pipette washer to rinse the pipettes at least three times with tap water, followed by at least three times with RO water.

Put the pipettes in the 110°C oven to dry.

Special Cleaning Instructions for Buchner Funnels with Fritted Disc

("Gooch" used for the P_2O_5 Gravimetric Method)

Rinse with tap water.

Soak in 1:7 Ammonium Hydroxide solution for at least two hours. To make a fresh 1:7 Ammonium Hydroxide solution, add 0.4 L of Ammonium Hydroxide and 2.8 L RO water.

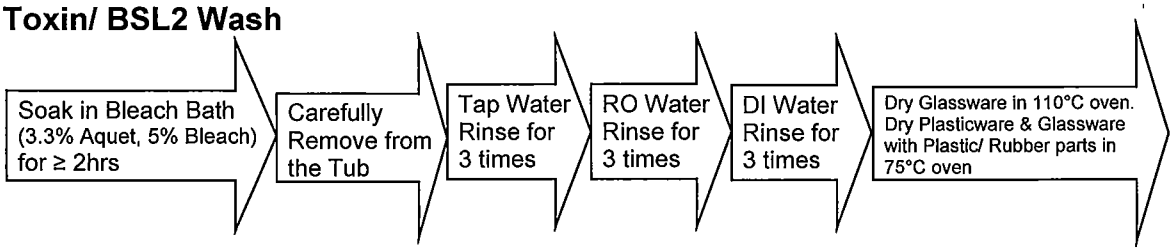
Attach funnel to vacuum stand, and rinse three times with RO water.

Air dry at room temperature.

Summary of the Manual Washing & Drying Procedures

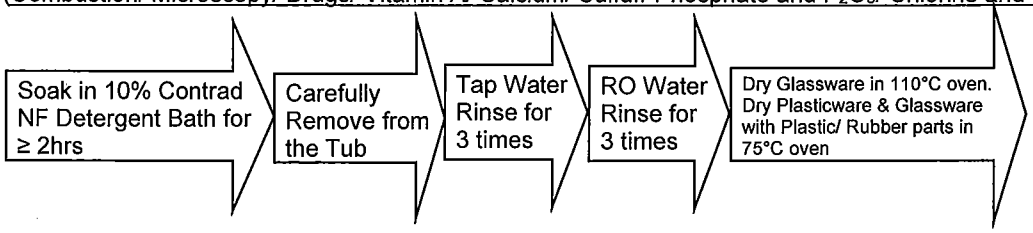
Apply acetone to remove the writing and rinse off with tap water to remove all particles and prevent contamination prior to the following procedures-

Toxin/ BSL2 Wash

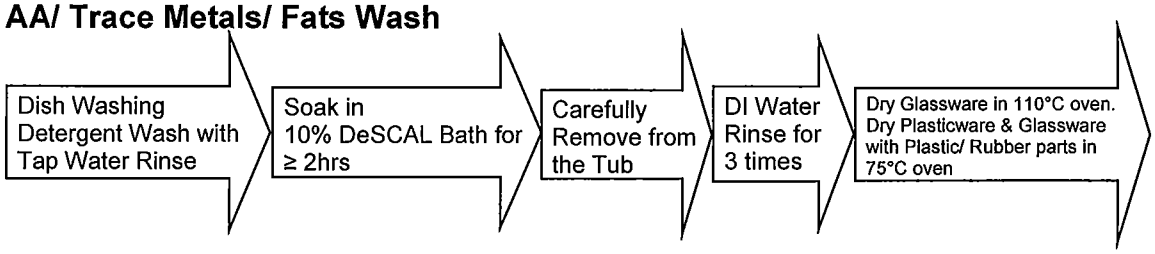


General Wash

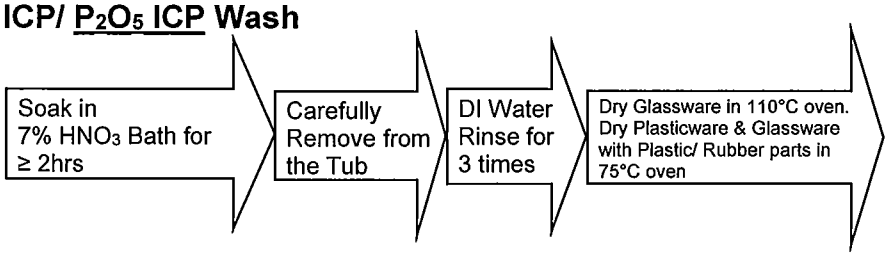
(Combustion/ Microscopy/ Drugs/ Vitamin A/ Calcium/ Sulfur/ Phosphate and P_2O_5/ Chlorine and Salt)



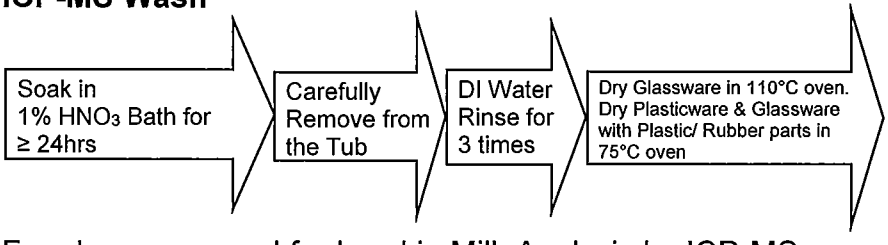
AA/ Trace Metals/ Fats Wash



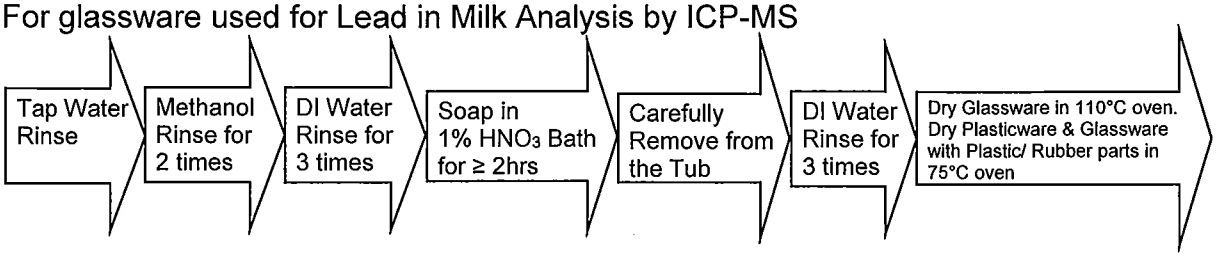
ICP/ P_2O_5 ICP Wash



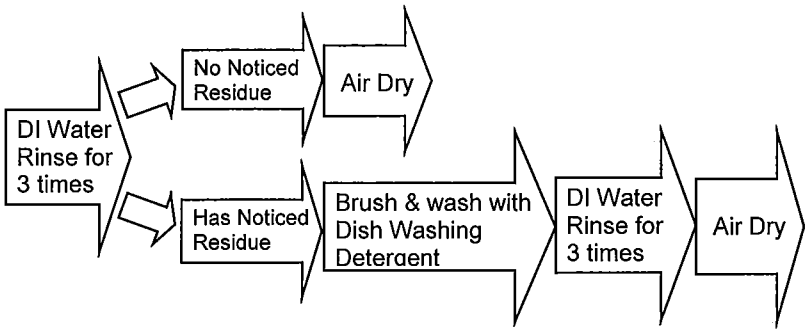
ICP-MS Wash



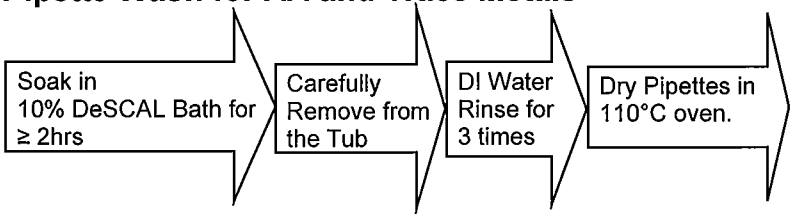
For glassware used for Lead in Milk Analysis by ICP-MS



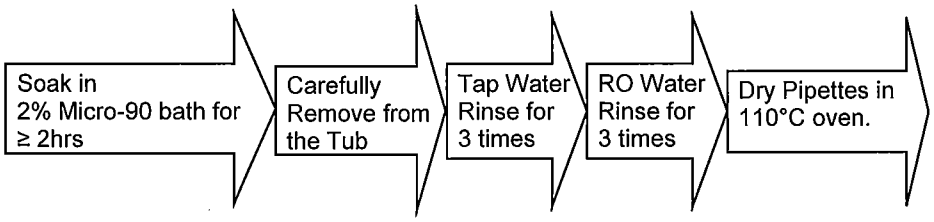
LCMS/ Dioxin Glassware Wash



Pipette Wash for AA and Trace Metals

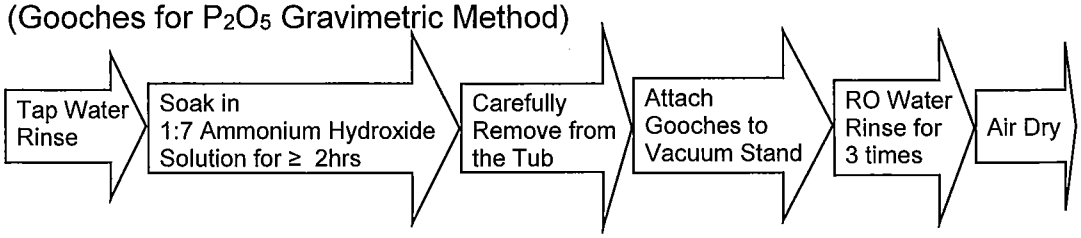


Pipette Wash for Vitamin A, Sulfur, Phosphate, and P_2O_5 Gravimetric



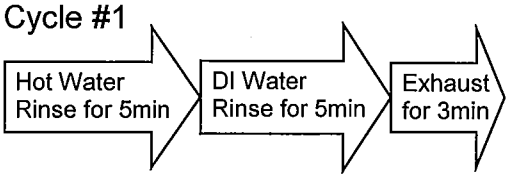
Special Cleaning Procedures for Buchner Funnels with Fritted Disc

(Gooches for P_2O_5 Gravimetric Method)

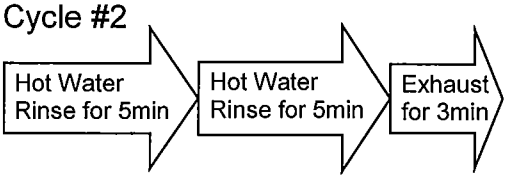


Parameters of the Automatic Washing Cycles (same drying procedure as manual wash)

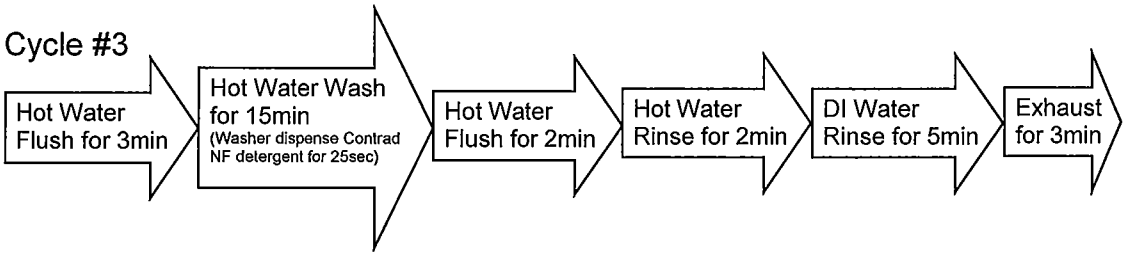
Cycle #1



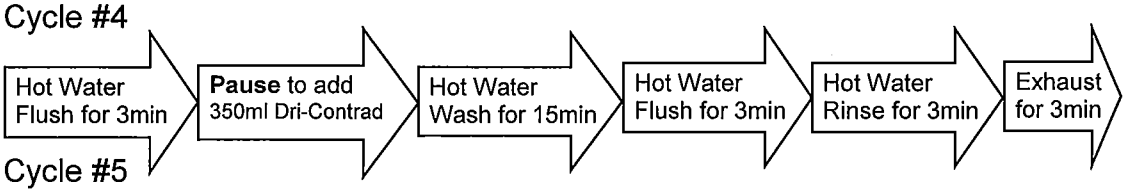
Cycle #2



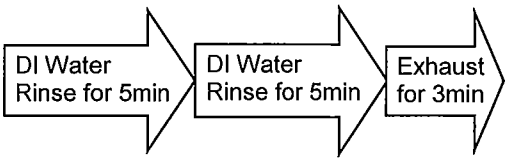
Cycle #3



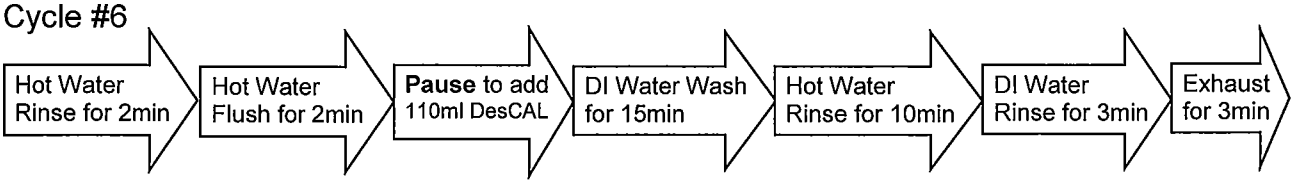
Cycle #4



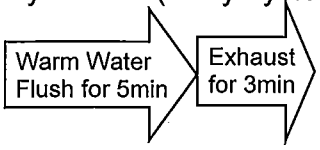
Cycle #5



Cycle #6



Cycle #20 (Daily cycle #20 wash is required prior to washer shutdown)



Revision History

Revision 1 – New format and added ICP-MS glassware cleaning procedure September 2013

Revision 2 – Added glassware cleaning procedures for LCMS and Dioxin glassware May 2014

Revision 3 – Added additional 1% Nitric Acid bath cleaning steps for Lead in Milk Analysis by ICP-MS glassware. September 2015

Revision 4 – Added procedures for when the automatic washer is unavailable, washing procedure for fats, washing cycle parameters, created summary process flowcharts, and thoroughly edited the SOP. YH February 2018