Standard Operating Procedure
for RCA Clean

Facility: ERC Clean Room
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Scope: This SOP details the process for Boron diffusion.

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The RCA clean is a standard set of wafer cleaning steps which needs to be performed before high temp processing steps (oxidation, diffusion, CVD) of silicon wafers in semiconductor manufacturing. Werner Kern developed the basic procedure in 1965 while working for RCA, the Radio Corporation of America [1] It involves the following:

1. Removal of the organic contaminants (Organic Clean)
2. Removal of thin oxide layer (Oxide Strip)
3. Removal of ionic contamination (Ionic Clean)

PREPARE THE FOLLOWING MIXTURES:

Organic Clean Mixture :

The mixture should not be made more then 45 minutes prior to being used.

Label the beaker contents with a water soluble pen. (DeGrease Etch)

Measure 75ml of DI in cylinder, and pour into beaker

Measure 15ml of Hydrogen Peroxide in cylinder, and pour into beaker

Measure 15ml of Ammonium Hydroxide in cylinder, and pour into beaker

Stir solution with clean teflon rod. Place beaker into the temperature-controlled water bath and adjust the hotplate to maintain the solution temp at 50 ^{0}C.

Rinse cylinder with tap water and place in dish pan to be washed.

Oxide Strip Mixture:

Measure 150ml of DI water in the 250ml cylinder, and pour into a teflon beaker

Measure 3ml of Hydrofluoric Acid in 10 ml cylinder, and pour into beaker

Cover beaker with teflon dish cover.

Rinse cylinders with tap water and place in dish pan to be washed.

Ionic Clean Mixture:

Label the beaker contents with a water soluble pen. (DeMetal Etch)

Measure 80ml of DI in cylinder, and pour into beaker

Measure 20ml of Hydrogen Peroxide in cylinder, and pour into beaker

Measure 10ml of Hydrochloric Acid in cylinder, and pour into beaker

Stir solution with clean teflon rod. Place beaker into the temperature-controlled water bath and adjust the hotplate to maintain the solution temp at 50 ^{0}C.

Rinse cylinder with tap water and place in dish pan to be washed.

Cleaning procedure steps are as follows.

1. Place wafer(s) in teflon basket.

2. Submerge the basket with wafer in the **Organic Clean** solution for 10 minutes heated to 50 ^{0}C

3. Remove basket from the bath and rinse wafer in the DI water for 1 minute.

4. Submerge the basket with wafer in the **Oxide Strip** solution for 15 seconds.

5. Remove basket from the bath and rinse wafer in the DI water for 1 minute.

6. Submerge the basket with wafer in the **Ionic Clean** solution for 10 minutes heated to 50 ^{0}C

7. Remove basket from the bath and rinse wafer in the DI water for 1 minute.

8. Remove basket from the DI water and blow dry with nitrogen.

Work area cleanup procedure:

1. Dispose of **Organic Clean** in properly marked waste container. Rinse beaker twice with DI water and put in dirty glassware tub.

2. Dispose of **Oxide Strip** in properly marked waste container. Rinse beaker twice with DI water and put in dirty glassware tub.

3. Dispose of **Ionic Clean** in properly marked waste container. Rinse beaker twice with DI water and put in dirty glassware tub.

4. Manually rinse the work area with DI water, wipe it with clean room wipes, and rinse the rubber gloves that you have been wearing.