

520.495/580.495 Microfabrication Laboratory

Laboratory Assignment

Silver Plating

I. Prelab Work: None, credit will be given to the post-lab.

II. Lab Work:

Solution Preparation

1. Prepare the Zincate solution: 190mL DI H₂O, 83mL Techni Alkaline Zincate
2. Prepare the Nickel Strike solution: 190mL DI H₂O, 45mL Technic 9109A, 30mL Technic 9109B
3. Prepare the Nickel Plating solution: 200mL DI H₂O, 37.5mL 9185B, 12.5mL 9185A
4. Prepare the Argentomerse solution: 200mL Argentomerse
5. Prepare 4 beakers with DI H₂O to rinse after each plating step.
6. Heat the Nickel Strike solution to 100°F on a hot plate.
7. Heat the Nickel Plating solution to 190°F on a hot plate.

Plating Procedure

1. Immerse your wafer in the Zincate solution for 30 seconds. Observe the color before and after immersion.
2. Rinse your wafer for 1 minute in DI H₂O
3. Immerse your wafer in the Nickel Strike solution (on the hot plate) for 15 minutes.
4. Rinse your wafer for 1 minute in DI H₂O
5. Immerse your wafer in the Nickel Plating solution (on the hot plate) for 15 minutes.
6. Rinse your wafer for 1 minute in DI H₂O.
7. Immerse your wafer in the Argentomerse solution for 5 minutes. Observe the color before and after immersion.
8. Rinse your wafer for 1 minute in DI H₂O.

Wafer Assessment

1. Choose a location on each of your wafers to perform measurements on.
2. At the beginning of the lab and after each of the plating steps, take a profilometer reading of the thickness of the metal layers.

III. Postlab Work:

1. Why is it necessary to plate the aluminum electrodes with silver?

2. Justify the changes in thickness observed at each step. You may want to reference articles in “Metal Finishing” available through Science Direct journals on the JHU library website. It may be helpful to do searches on electroless (autocatalytic) plating and immersion plating.

Lab procedure prepared by J. Blain, Fall 2002