





Archimedes' density test Protocol 1

**Equipment and accessory**

1. Four digital balance
2. Water
3. Procedure A: Plastic container, metal mesh basket and metal wire  
Procedure B: Plastic container, metal mesh basket, metal wire, and aluminum bridge.

**Pre-check and calibration:**

If the deviation of 200g calibrated weight is over 0.5 mg, you need to do calibration.

	
<p>1. Zero the balance and put the calibrated weight on the weighing pane. Please wear gloves when handle the weight.</p>	<p>2. This is a worse scenario with a deviation about 12.1mg. You definitely need recalibration</p>
	
<p>3. Press calibration key when nothing is on the balance and you will see "cal" blinking</p>	<p>4. When "200.0000 g" bilking, put the calibrated weigh on the weighing pane, close the door</p>



5. When the blinking goes off automatically and "0.0000 g" starts blinking, take the weight away.



6. Calibration computation will take about 1 minute, do not touch the balance.



6. When calibration is done correctly, the screen will show "CAL done".



7. Check the reading with calibrated weight.

**Operation Procedure A:**



1. Prepare mesh basket, metal wire and plastic container.



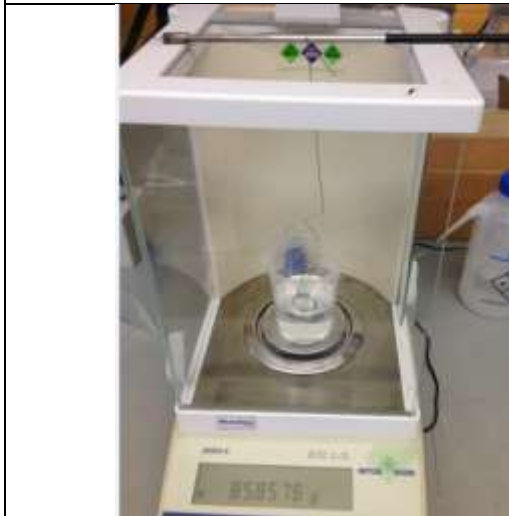
2. Zero the balance.



3. Weigh the specimen,  $w_1 = 6.9490$  g



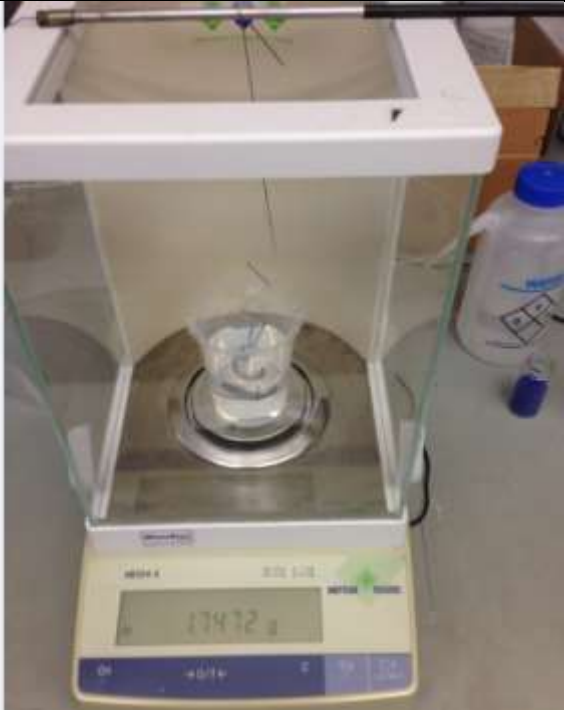
4. Put plastic container with water on the scale,





5. Dip empty mesh basket in water, not touching any walls, do not overload balance! Use less than 100mL water



6. Zero the reading.

	
<p>7. Drop the specimen in the mesh basket, get rid of any air bubbles. Recode the reading <math>w_2 = 1.7472 \text{ g}</math></p>	<p>8. The density of specimen is <math>w_1/w_2</math> (<math>\text{g/cm}^3</math>), <math>= 6.9490 / 1.7472 = 3.977 \text{ g/cm}^3</math></p>

**Operation Procedure B**

	
<p>Setup metal bridge and hanger, zero balance</p>	<p>Weigh the specimen <math>w_1 = 6.9491 \text{ g}</math></p>



Move plastic container with sufficient water to dip specimen in water, do not spill water. Make sure specimen is immersed. Remove air bubbles but do not remove any water. Recode  $w_2 = 4.6212 \text{ g}$

The density of specimen is  $w_1/(w_1-w_2) \text{ g/cm}^3$ ,  $6.9491/(6.9491-4.6212) = 2.985 \text{ g/cm}^3$

Edited by Yuwei Fan @ 12/22/2014