OXYGEN FLASK CALIBRATION PROCEDURE

CLEANING

Wash each flask and stopper thoroughly inside and outside with tap water x3 and then distilled water x3. Once clean, **DO NOT TOUCH THE FLASK WITH YOUR FINGERS – WEAR GLOVES**.

WEIGHING

A. Pre-weighing procedure

- Thermometers need to be within a ½ degree of each other.
- Ensure balance is on and stable.
    - The balance will need to have a range up to 300 grams and weigh to the thousandths place (1 milligram).
    - Ideally, each flask can be known to ±0.003 mL.
    - Use the METTLER TOLEDO CO2 lab's analytical balance.

B. Dry weighing (g)

- While wearing gloves, place the flask with its stopper on onto the weigh pan and weigh. Allow the scale to stabilize and record the weight.
    - Weigh at least twice to confirm weight.
    - Record dry weight

C. Wet weighing (g)

- Have distilled water that has been sitting out for at least two hours.
- Rinse the stopper and the neck of the flask.
- Pinch noodle, place at bottom of flask at an angle and slowly fill the flask with distilled water (overfill).
- Pinch tube to pull noodle out.
- Place the stopper onto the flask. Ensure there are no trapped bubbles in the flask.
- Pour off any excess water that was displaced by the stopper. Carefully, wipe excess water off the flask and around the stopper.
    - Use spatula and Kimwipes to get down around stopper in neck.
- While wearing gloves, place the flask and its stopper on the weigh pan and weigh. Allow the scale to stabilize and record the weight.
    - Weigh at least twice to confirm weight.
    - Record wet weight.

D. Temperature (Celsius)

- Remove the flask from the weigh pan. Insert a thermometer into the flask. Record the temperature to the tenths place (i.e. 22.7) after two minutes.
    - Can also have a thermometer in a beaker of the same DI water next to setup and use that temperature.
    - Record temperature.

CALCULATIONS

A. rw = 0.999842594 + 0.00006793952*(temperature) - 0.00000909529*(temperature)^2 + 0.0000001001685*(temperature)^3 - 0.000000001120083*(temperature)^4 + 0.000000000006536332*(temperature)^5

B. Vol (@RT) = (buoyancy correction)*((filled weight) – (dry weight))/(rw)

buoyancy correction = 1.00105

C. Vol (20C) = (Vol (@RT))*(1 + 0.00001*(20 – (temperature)))