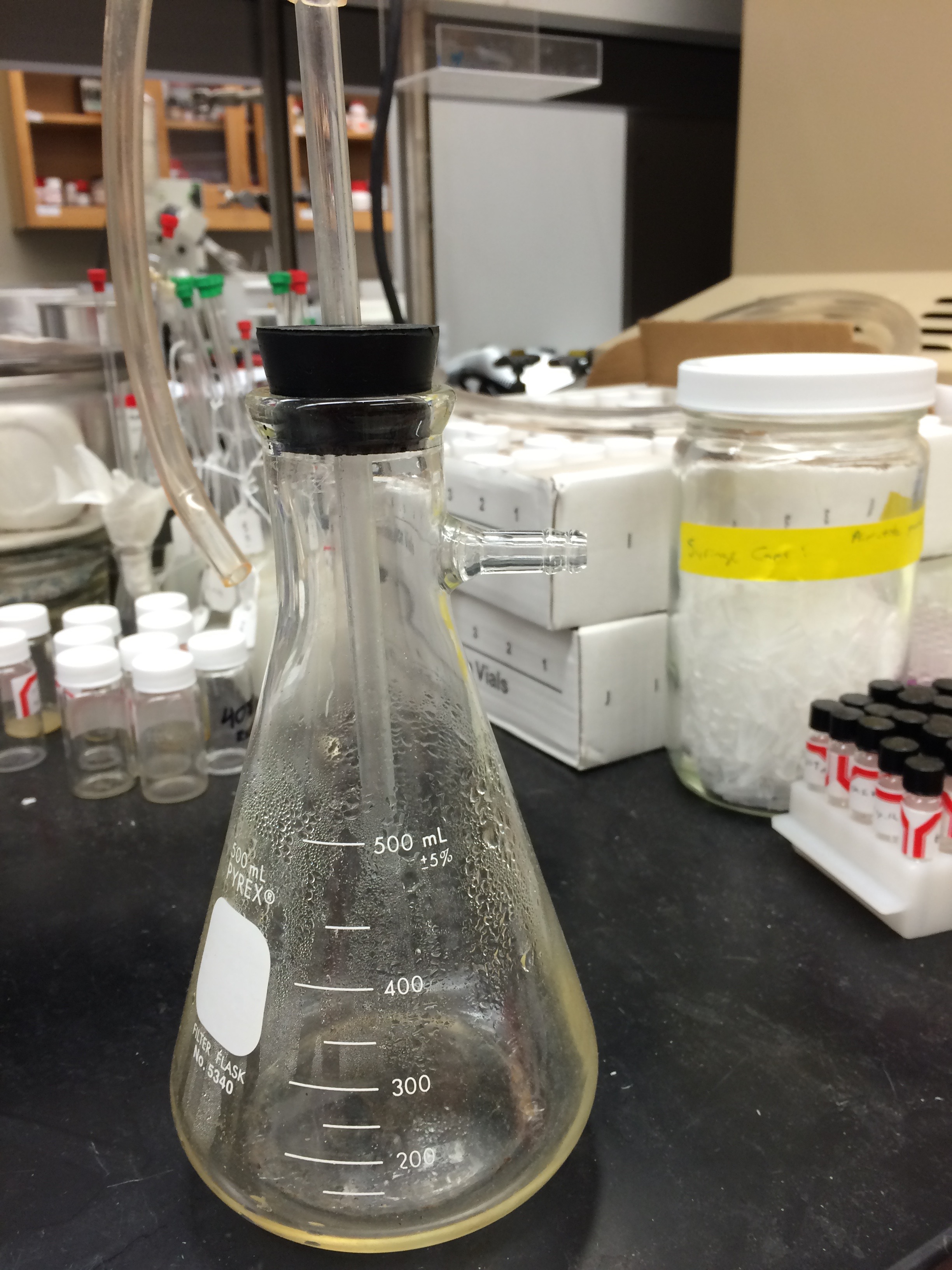
Vacuum Maintenance Procedure:

The Pumps **must** to be checked periodically to prevent them from breaking. There are two pumps, which require separate cleaning procedures. Consult the manuals for further instructions.

* Standard operating procedure for a mercury manometer
  + Obtain and fit a 500 mL vacuum Erlenmeyer flask with a tube penetrating a black septum (pictured below)
  + Connect the manometer to the inlet through the septum
    - This is to prevent mercury backflow from contaminating the lab
    - This flask should be **segregated from any other use**
  + Connect the inlet of the vacuum to the side arm
  + Label the flask properly
  + Make sure you’re reading the pressure correctly
* Labport rotovap pumps
  + Preventative measures: make sure to add ice to the pump bucket to increase the efficiency and longevity by running ice cold water through the coil. For volatile solvents e.g. DCM and Et2O, use an ice bath to cool the collection flask.
  + These pumps contain a Teflon coating on the inside, so they are more durable to solvents passing through them compared to the oil pumps. They must be washed by passing solvent through them. Take a 500mL vacuum filtration flask with a black septum, and set it up like this:
  + If the vacuums should be operating at around 20 Torr at the pump. If the vacuum is poorer than that, then a cleaning procedure is required.
    - Pour a cleaning solution such as acetone+0.5% conc. HCl, water+surfactant, etc. into the vacuum Erlenmeyer flask.
    - Connect the inlet to the tube penetrating the septum.
    - Submerge the glass tube into the cleaning solution
    - As the cleaning solution passes through the vacuum, pull the inlet tube out of the solution, and repeat the procedure until the liquid comes out clear
  + Measure the vacuum at the manifold with an empty flask attached, and measure the vacuum at the pump
    - Record both of these values in a vacuum log (depicted below)
      * If the rotovap is leaking vacuum, make sure the seals are clean, and setup correctly
  + It is not completely clear from the manual how to properly setup the interface of the rotovap. The black O-ring is supposed to go on the outside of the seal to prevent condensation from leaking into the motor.
* Oil pump maintenance
* Print out the log on the following page for use as a hard copy
  + Make sure that the correct oil is in the correct pump. There are different grades for the different pumps.
  + Measure the vacuum at the pump and at the Shlenck manifold **every** month.
    - Use the electronic manometer to measure the pressure below 1 Torr
    - If the vacuum too high, then change the oil
  + Wash the inside of the pump with a purchased surfactant mixture
    - Recommendations of use are listed on the bottle
  + Replace the oil with the correct oil, turn the pump on for 20-40 minutes, and repeat until the oil comes out the same color as the oil put in

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| **Checked by**  **(Initials)** | **Date** | **Good? (Y/N)** | **Torr at pump** | **Torr at manifold** |
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