Flowing Gas

Current State of Detector: Detector is being pumped

- *Valves that are closed: $0a_{bot}$ (bottle)*
- *Valves that are open: $0a_{reg}$ (regulator), 1a, 3, 4, 5, 6, 7, 8, 9, 10*

Flowing gas:

- Close Valves: $0a_{bot}$ (should already be closed), $0a_{reg}$, 1a, 5, 8, 9, 10
    - $0a_{bot}$, $0a_{reg}$ closes the gas bottle and regulator
    - 1a closes the gas line
    - 5 closes the detector return
        - Eventually, we will slowly/barely open 5 to get the correct flow rate
        - Flow rate should be ~1000 sccm (standard cubic centimeters per minute)
    - 6, 7 control flow through source holder
        - We don't need this at the moment
    - 8 closes one of the bypasses
    - 9 closes one of the bypasses
    - 10 closes the large pump-out
        - This should cause pressure to increase slightly
- Open Valves: 3, 4, 6, 7 (all should already be open)
    - 3 is the main line
    - 4 is the detector source
        - With 4 open and 5 closed we can let gas into the detector and control flow rate by finely adjusting 5
- Open $0a_{bot}$
    - Right gauge should read ~2700 psi
- Open $0a_{reg}$
    - Set to ~5 psi
    - Make sure blue release valve is open
- Open valve 1a
- Set mass-flow controller to desired pressure: 800 Torr
- Adjust valve 5 to desired flow rate: (Typically 20 sccm)

Pumping

Current State of Detector: Gas is Flowing through the Detector

- *Valves that are closed: 8, 9, 10*
- *Valves that are open: $0a_{bot}$,$0a_{reg}$, 1a, 3, 4, 5 (partially), 6, 7*

Pumping:

- Set mass-flow controller to zero pressure
- Close Valves: $0a_{bot}$, 4, 5, (9, 10 should already be closed)
    - $0a_{bot}$ stops gas
    - 4, 5 seals off the detector
- Open Valves: 8, ($0a_{reg}$, 1a, 3, 6, 7 should already be open)
- Open valve 9
- Open valve 5 for slow pumping
    - Don't want to create too much wind in the detector, which is why 4 is closed and we are only slowly opening 5.
- When pressure in chamber is below 200 Torr, open valves 4, 10, and 5 all the way