

# Osterloh Lab GC Irradiation setup

2-9-09

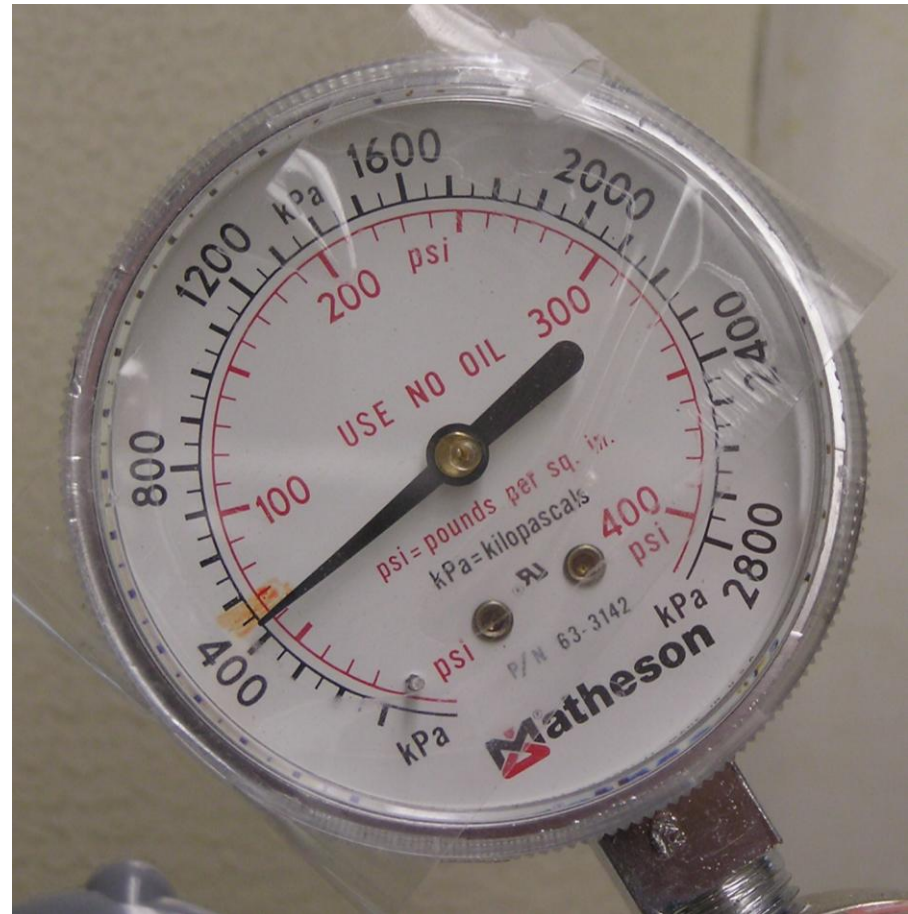
Andy Frame

# Many new features

- New Xe arc lamp
- New reaction vessel
- Water cooled IR (solution) filter
- Long pass filters for UV removal
- “Ceiling fan” installation
- Temperature probe for hood/solution
- Pressure at 425kPa constant
  - Lack of flow controller operation

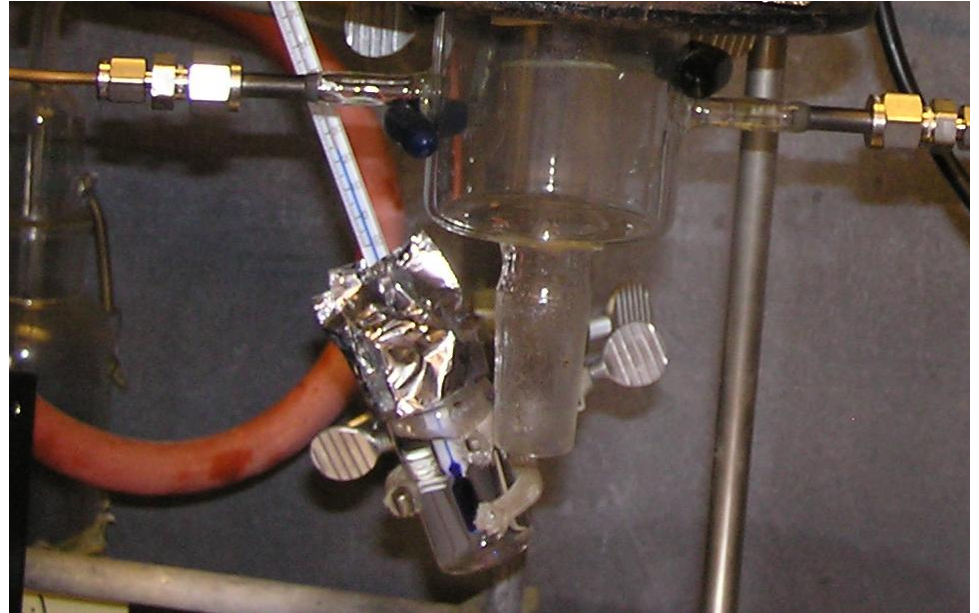
# Pressure

- Must be at 425kPa
- Flow controller is dictated by inlet pressure



# Reaction vessel

- Still very Fragile
- Care required to install flasks into vessel
- Hold pressure to 2-3 torr for 48 hours
- 60mm diameter x 60mm height
  - Designed to overcome diffusion problems



# Water cooled IR (solution) filter

- Keep volume at 3.5L mark
  - Fill with DI water only
- Monitor water temp
  - Keep under 35deg C
- Removed all air bubbles from the line
  - Slows flow rate dramatically
- Pumps at ~400mL/min
  - Check regularly
- Check for any leaks periodically



# Water cooled IR (solution) filter

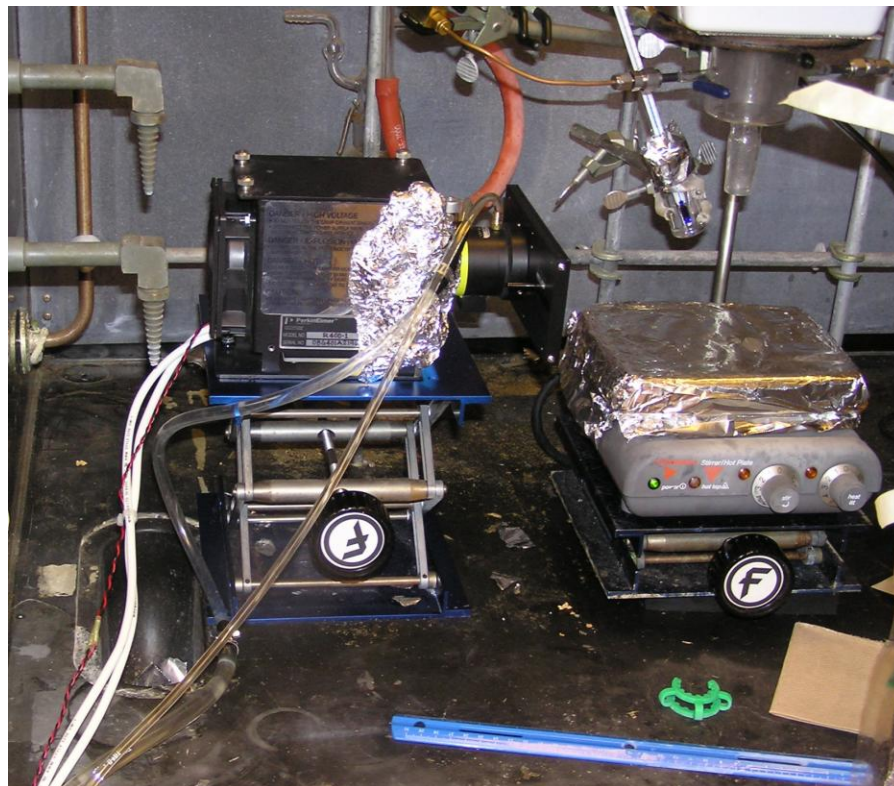
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- Remove water and refill as needed
  - 3.5L fill line
- Power to pump needs to be on at all times while lamp is on



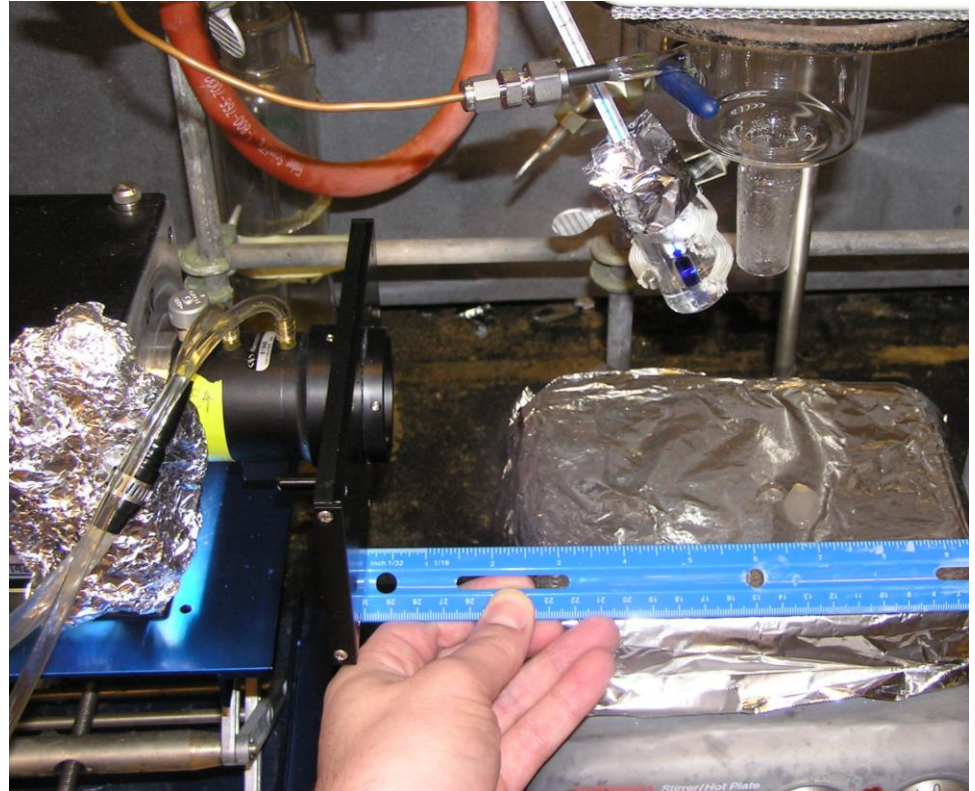
# Xe Lamp

- Shutter can only be closed for 30min max while lamp is on
  - cooling rate of IR cell
- $\sim 400\text{mW}/\text{cm}^2$
- Lamp shouldn't be cycled on/off constantly
- Use shutter (and safety UV glasses) while taking GC measurements



# Xe Lamp

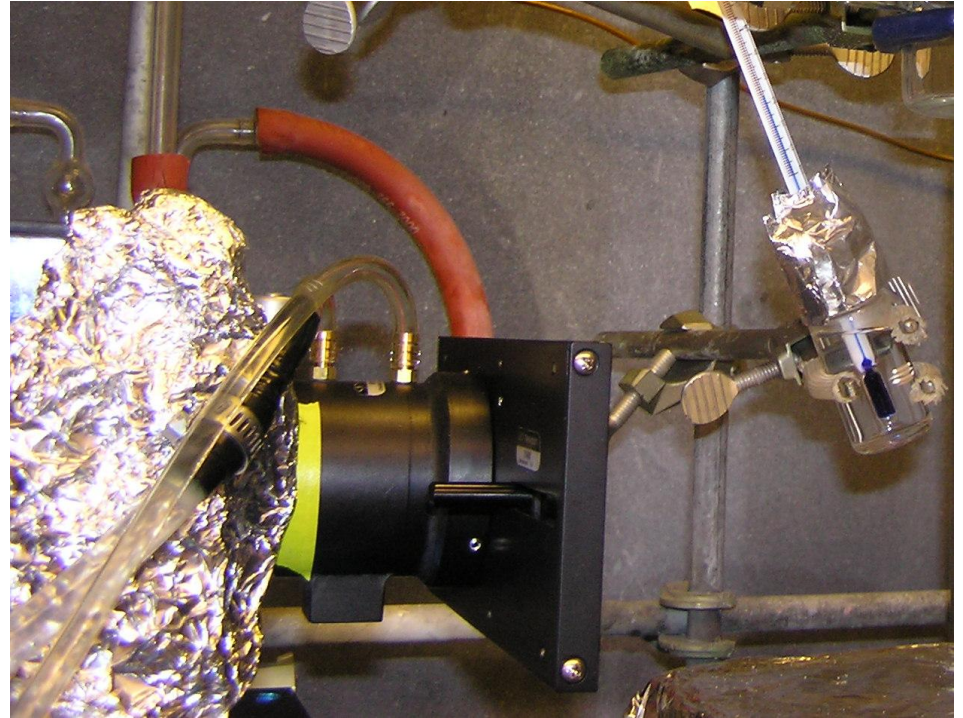
- Sample needs to be 6 inches from shutter edge to center of flask





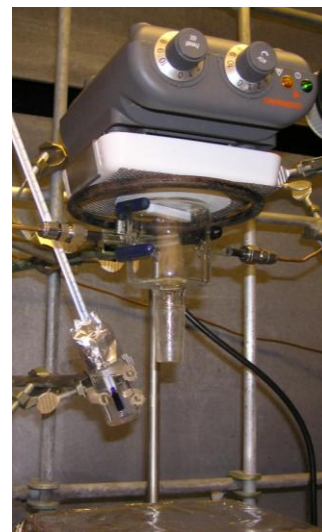
# Temperature probe

- Necessary because IR filter is not 100% efficient
- Used to give approx hood and solution temps
- Will move to beam path on opposite side



# Ceiling fan

- Necessary and overcomes diffusion problems
- Inverted stir plate is NOT resting on reaction vessel
  - Few mm above it
- Turn on/off slowly
  - Else stir bar will fall
- Maximum stir speed setting of 4
- Note base of ring stand coincides with solution stir plate



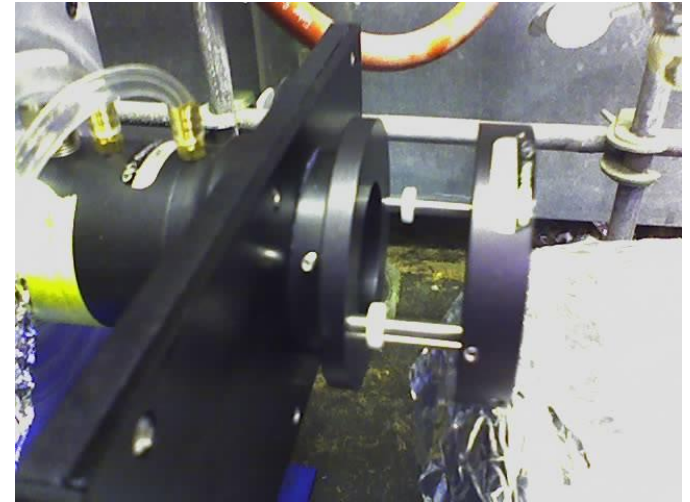
# GC sampling/injections

- No weight on gas valves
  - Fragile
- No need to leave pump on during evolution experiment
  - Annoy Troy/Sarah
- Wait 2 min from expansion of gas into injection line to inject into GC
  - Due to % removed and spatial relation
- 2nd injection sometimes needed
  - More on this when spreadsheet is complete
- Bakeout GC every 2 weeks

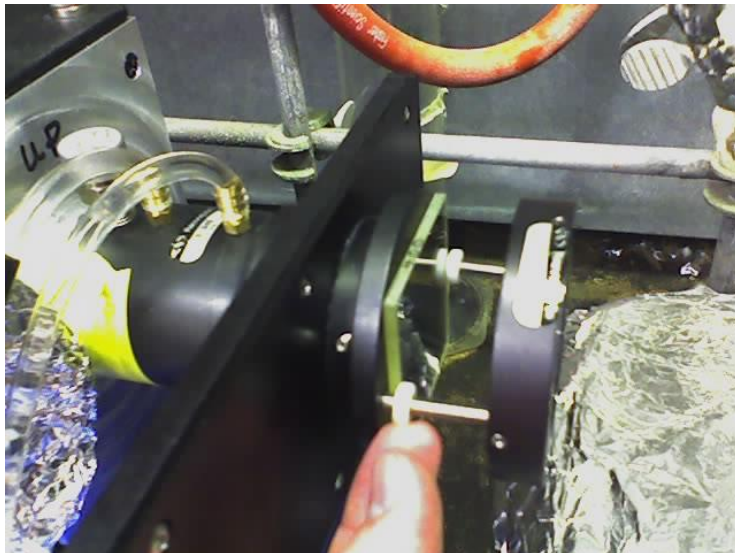


# UV filters for Xe lamp

- Filter holder installed (Feb 6, 2009)
- Always install UV filters next to IR filter side (not sample side)
- Only use fingers to lightly tighten nuts
  - Purpose of nuts is only to gently hold UV glass
- No need to remove holder when not using a filter
- Only use mild soap, water/Kimwipe to clean the filters.
  - Never use a brush or any other solvent
- Sample distance is still 6 inches from edge of shutter (unchanged)



Install UV filter  
next to IR filter



Lightly tighten  
nylon nuts

