

Handout for UV reactor

Updated by Yun Zhu

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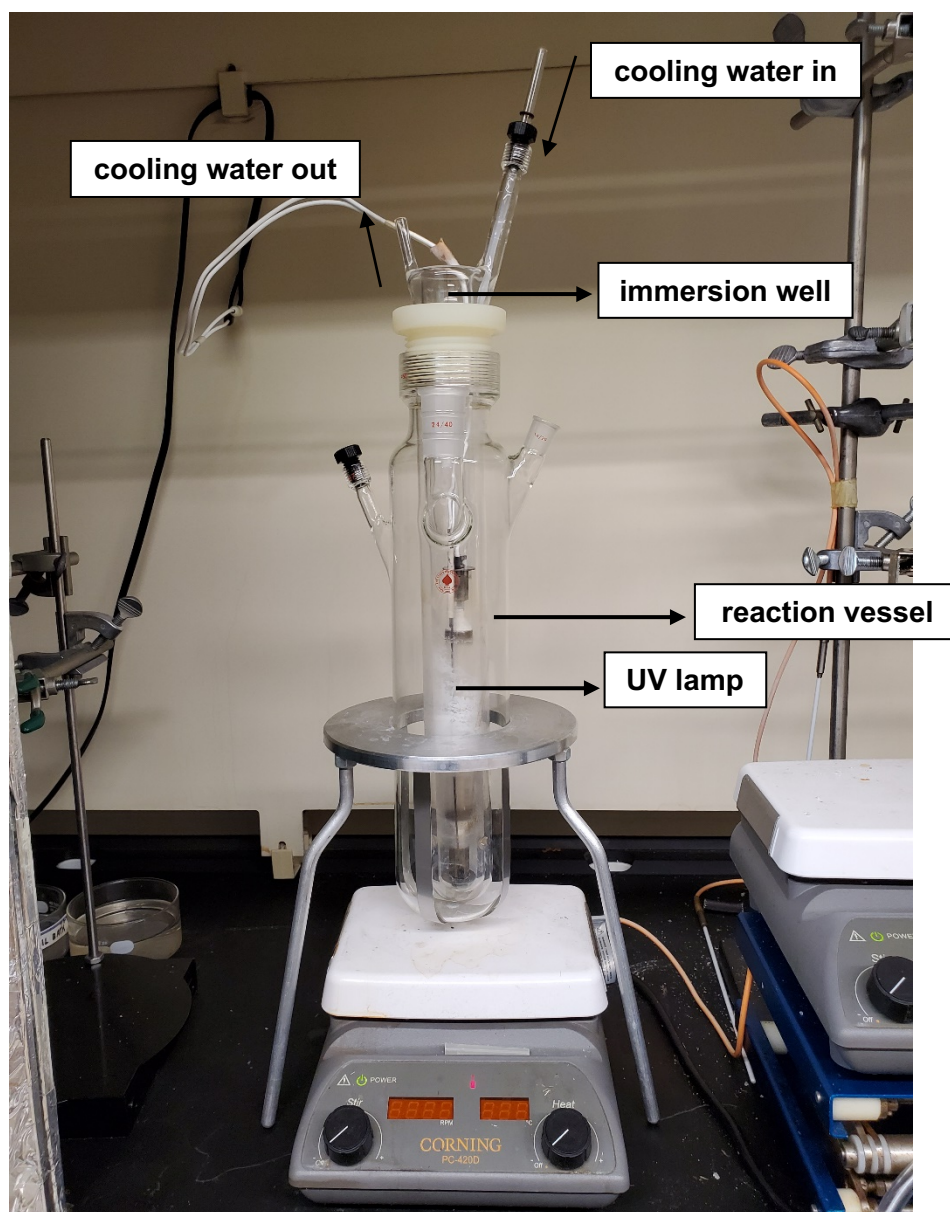


Figure 1. Picture for a complete setup



Figure 2. Power supply



Figure 3. View from outside

- 1. Always wear the UV protective glasses (circled above) while manipulating the instrument and when the lamp is on.**

Warning: UV radiation is permanently damaging to the retina of the eye, and prolonged exposure can cause skin cancer.

- 2. Connect cooling water to the immersion well. The cooling water should be always on during the reaction.**

The total power of the setup is 450 watts, of which 175.9 watts is irradiated, the remaining watts is transformed into heat (~ 275 watts). Without cooling water, the heat generated can easily evaporate the solvent in the reaction vessel and cause safety hazard.

The optimum working temperature for the lamp is 20~50 °C. Lower temperature will shorten the life of the lamp, and the lamp may not light.

3. Add your reaction mixture to the reaction vessel if it has a large scale. Turn on the lamp.
The immersion well is made by quartz,
4. After your reaction has been set up, close the SASH of the fume hood to make sure that the light is completely shielded from outside (see the Fig.3).
5. Fill the emergency contact form and post it on the sash.
6. After the reaction is finished, the reaction vessel and immersion well should be cleaned immediately. Use deionized water and isopropanol to clean them. Dry before next use.

Soaked in base bath is *not* recommended. However, if you have to do that, the time should be *less than 1h*.

7. For small amount of reaction, you may use your own flask instead of the standard reaction vessel. In this case, clamp the immersion well and leave your flask close to it.

Note: normal flask is made by borosilicate glass, will has bad transmission rate for UV light (cutoff at ~300 nm)

8. If any accident happens, please inform Yun or Sam immediately.

Information may useful:

1. Two reaction vessels are available in the lab. Their total capacities are 500 mL and 1000 mL. The actual working volume is approximately 40-50% of total.
2. There are multiple joints on the reaction vessel, including one #7 Ace-Thred for thermometer, one #14/20 and one #24/40.
3. The lamp is a medium pressure mercury-vapor lamp. Its spectral characteristic data for the lamp is listed in the table below:

Table 1. Spectral Characteristics

Wavelength range (nm)	UVA 220-280	UVB 280-320	UVA 320-400	Visible 400-600	Infrared (Mercury lines) 1000-1400	Total radiated energy
Power (watts)	27.0	28.7	28.0	75.7	16.4	175.9

* Of total energy radiated, approximately 40-48% is in the ultraviolet portion of the spectrum, 40-43% in the visible, the balance in the infrared.

** For more detailed distribution, check the manual.