Experiment #9: Synthesis of Luminol

During the heating in Part II the solution steamed heavily and once erupted out of the test tube.
Be very careful when stirring.
Be sure to use a boiling stone and wear gloves and eye protection to avoid any possible injury that could result in being splattered by hot corrosive chemicals. NL

There are two different size Hirsch funnels. If possible, use the larger Hirsch funnel to get your product. I used the smaller one and the process was extremely time consuming. LM

Pay attention to color changes with this lab, and also to the boiling temperatures. KB

I found it pretty difficult to keep the temperature in the right limits for the experiment. I suggest slow light heat, otherwise it boils and then you remove the heat and the temperature drops below the desired temperature. Thus you are constantly either above or below temperature. Take the time to do subtle heating. DF

The substance/solution boils very easily, so when they say gently heat, thy mean gently heat and barely touch the bottom of the test tube. When it does boil, it boils vigorously. Make sure to maintain the temperature between 110 and 120 degrees Celsius in the beginning boiling part. To do this it is actually best, and worked for me, to just hold the Bunsen burner underneath the test tube so that you control how the solution should be heated. Also, after adding the KOH pellets, DMSO, and your luminol to the 250ml flask, it requires a lot of shaking to actually start glowing. it will be best to let air in at least twice and continuously shake the flask. It will be yellowy for while then change to a murky green color. This is when you know it is working and can go into thee dark room. NT

Make sure to not heat the test tube to aggressively because it can cause your thermometer to pop out and break delaying your experiment. this can be prevented with the use of a clamp or split stopper. AJ

When you vacuum filter your product don't worry if you can't get it very dry. The product is basically a sludge and getting it completely dry is difficult. Oh and don't get it on your hands, you'll smell like a squashed lightning bug for the rest of the day. CA

If your product doesn't light or is dim, don't worry :) You have to vigorously shake the flask and periodically remove the stopper to let air penetrate within your product. AG

A couple of tips for this lab:

-The heat applied to the test tube can be regulated by moving the burner closer and farther away; you can maintain a steady temperature once you find the sweet spot.

-The luminol does not need to be completely dry for this experiment, but it is harder to transfer it into the Erlenmeyer flask when it's very wet (tends to stick to the walls of the flask). BL

In part 1 make sure to use the micro burner, I used the regular size burner at first and my solution almost boiled over. LC

Don't place the burner too close to the test tube just because you want to speed up the process. If you place the flame too close it will heat up quickly and once you remove the flame the solution stops boiling. It is better to place the burner just a little lower and let the solution heat at its own pace. This will allow you to better control the temperature. MZ

Since there is change in air flow, try to keep the window on the hood down. Also, monitor the amount heat applied in the experiment. BMB

When vacuum filtering this, make sure to use a bigger filter, because this product is pretty gunky and will cause you much heart ache. The product is very slow to move down the filter. JM

The most important point for this lab I felt was appropriate heating. I found it useful to simply hold the microburner for short periods slightly under the test tube to achieve a constant temperature without having it boil over to quickly. I would recommend trying this. DF

he glow of the final product can be a blue color or green/yellow color. Be sure to add sufficient amounts of KOH pellets so the solution can be saturated completely when shaking it in the beaker. This along with hard shaking will allow for a brighter glow. SF

Another hint for the final product, is before shaking make sure that a sufficient amount of air is being mixed with your final product along with your KOH pellets. It seemed when more air was added the brighter it would glow. DD

Ladies and gentleman of the new school year!! please don't stir your contents with a thermometer while you are heating, or else it will explode (even if the thermometer can go up to 200 C) TM

After completing the experiment as indicated in the lab handout I was wondering how the outcome would be effected if the KOH pellets were smaller, even possibly in powder.

After the initial shaking and oooing and ahhhing, I let the illuminated flask sit for about 20 minutes open to the air and then returned to the "darkroom" and the glow was much stronger and more noticeably blue. It would be interesting to me to record how the reaction is effected by time. How long the solution will glow for, when the intensity of the glow peaks and if it could be prolonged by slowly adding and reacting fresh KOH. These results could then, possibly, be used to develop stronger and longer lasting "glow sticks" or commercial "chemlights."

When doing the vacuum filtration, the materials provided in the lab were limited to the little Hirsch funnels. I was wondering if there was a reason for this. I had a good deal of product and it seems to me that using a larger Hirsch funnel would have been faster and more effective. NL

Perhaps students can try different variations of this experiment (e.g. different amounts of reactants, different heating times, different heating temperatures) to see how these variables affect the color and/or brightness of their product. LM

Another fun idea for this experiment could be making them glow differently by using dyes to change the colors. KB

If possible to improve the experiment, could possibly different colors be made during the illumination process in which the students will based on color have to identify their product. DD

Another way to change this experiment is to use a different combination of chemicals like we have done in the past to see which combo gets the best glow. You could assign them based on lab station. AJ

Using a higher amount of reactants and different reactants at different stations to see variation of glow. MJ

This was a cool experiment!

I was disappointed that the glow of my luminol wasn't as bright as my classmate Chris' was. So, my suggestion for this lab is to do a Part 2 or Week 2 of this lab and challenge students to perfect/optimize their experimental techniques and have a challenge to see whose shines the brightest. Students could do

a bit of research into what makes the luminol glow the brightest. It will also challenge their experimenting techniques as it's the last experiment of the semester. JW