Experiment #4: Synthesis of Azo Dyes

When drying your dye product, spread it out on the filter paper as much as possible to expose the greatest amount of surface area for drying. It will dry faster and more completely. MS

Include a brief description of why the dyes adhere to the different fibers to produce different colors. I.e. why does wool dye a different color than diacetate? Dye Adherence. MS

You must wait for your beaker to dry before weighing the product. Otherwise, a faulty mass will be obtained. One method to quickly cool the beaker is to place it in an ice bath or cold water bath. ML

It is smart to label you fabric swatch so that you know which fabric is which. It is easy just to place your initials in the top corner of one side so that you don't have to gather other swatches and compare as to what type of fabric color the diacetate and the wool is. JS

You might have difficulties with vacuum filtration of the final dye product since it is very moist and gooey. Try to keep it under the vacuum for a little longer and stir it.

Also try to get as much product off your spatula as you can to receive the most accurate yield. PO

This lab experiment is very messy so come prepare to get dirty and dye all over your fingers! JV

Make sure to go through this lab slowly. My greatest problem was the Buchner funnel for vacuum filtration in part II. My product was so thick that it blocked any liquid from being sucked down. This caused a problem because I had to take a stirring rod and scrape the bottom of the filter paper which only worked a little bit. Then the paper broke and I had to use what I had. So my dye had wet paper mixed in with it that would not peel off because of the wetness. Be careful and try to save as much of the dye as possible, but don't worry because you will still be able to dye your strip of fabric even with only a little bit of dye. NT

this lab is really messy so make sure your utensils are clean before starting. Also dont worry about collecting every piece of dye from all your utensil (as you will see it is very difficult) because you only need a small bit of dye in the end anyway to color the swatch. TM

If you do not get any powder product, you can use the filtrate diluted in some water to dye your strip of fabrics. AJ
Couple of tips for this lab:

-This experiment is very messy so have some paper towels handy; it is very likely that you will get some dye on yourself so dress appropriately and change gloves often.

-Pre-heat a hot plate before you start the experiment, this will save you some time later when you heat the suspension.

-Make sure your azo dye is fully dry before weighing it.

-Set up a hot water bath during vacuum filtration so that the solution is already boiling when you will begin dying your strip. BL

When writing your observations and lab report make sure to put the original color of your swatch and your lab partners swatch and then put the new color of your swatch and your lab partners swatch. If you don't you will lose points. LC

This is not only for this lab, but a lot of the labs. Be sure to check out the course website of the labs done previous years. Like with this lab, there were some great pictures and gave me an idea of what to expect and how certain starting materials would produce what color and dye the swatches. AG

Also when describing your colors of your swatch try to imagine a theme behind the color scheme, it will be useful for your lab report. DD

Make sure your gloves don't have unknown holes in them because the dye will get on your hands and stain your other clothes and items. JM

Make a note of which end is which on the fabric swatch. I had to dye a second swatch after I realized I could not tell which end was the wool on the swatch. YM

I noticed that you placed pictures of the experiment from previous years. It might be a good idea to ask students were there any similarities or differences in the swatches compared to not only the class, but also previous years. If so, what accounts for the differences? AG

Dry your product as thoroughly as possible, but don't be worried if it still has a clay-like consistency. I found that this was normal among most of the people in the lab.

After thoroughly drying your clay, then you will place a small amount into water and dye your fabric swatch. Instead of dying the swatch for 5 minutes, leave it in the beaker for a couple extra minutes, this may lead to more thorough dying. RR

The percent yield of the final product is very high, I for example received almost 220% yield. I am sure that the product had so many other products not purified. A suggestion would be to possibly either extract the product once again by using separatory funnel and some kind of solvent or filtrate it again. PO

Keep in mind depending on your Azo dye, it might become very thick so make sure when using vacuum filtration that the filter paper covers the entire funnel. MJ

It would be interesting to do multiple dilutions of the dye product on different fabric swatches to see how the dilutions affect the color of the dye you obtained. SF

I think it would be great to make tie-dye t-shirts with our azo dyes. Real-world application meets fun college activity. :) JW