

SP19 cochineal lake from dyed silk thread

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Cochineal Lake recipe: standard-reversed

- Following standardized recipes from "Natural Colorants for Dyeing and Lake Pigments: Practical Recipes and their Historical Sources" by Kirby et al.
 - Adapted by NJR

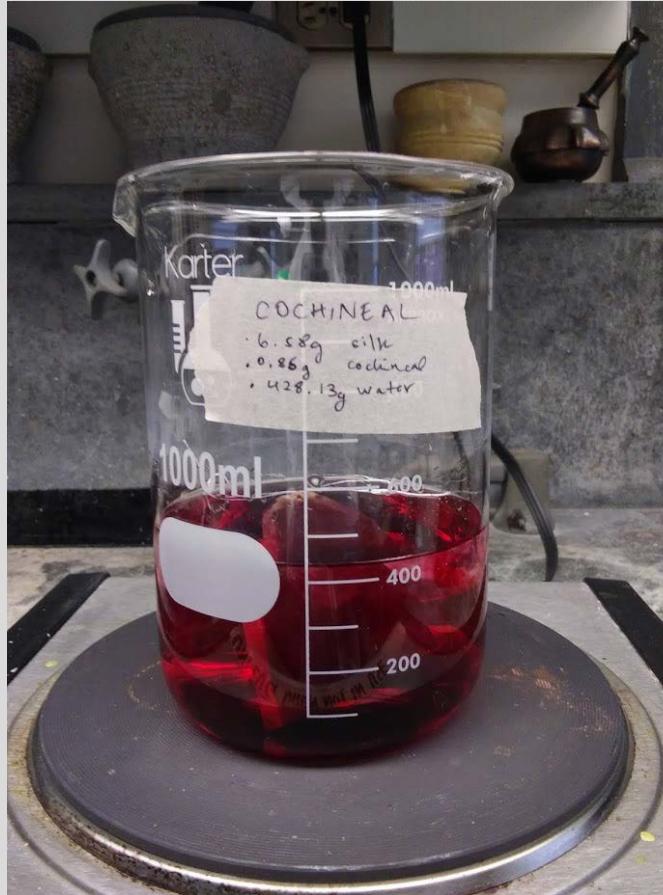
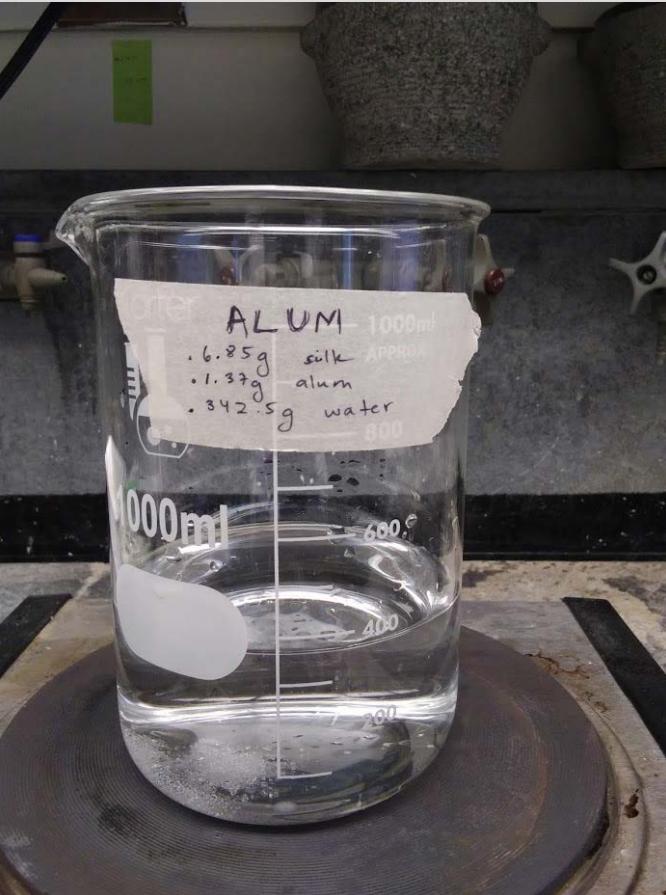
Cochineal lake - standard reversed			
Material	Original (g)	Amount /1g cochineal (g)	Amount (g)
cochineal	0.24	1	2
alum	10	41.666666667	83.333333333
water-alum	300	1250	2500
potash	4	16.666666667	33.333333333
water-potash	50	208.33333333	416.66666667

2019-03-18 extraction from silk			
Silk threadmordanted with alum and dyed with cochineal as per notes in "Dye experiments"			
Silk that was dyed =	6.85 g		
Pulled out bundle as reference sample =	0.18 g		
Weight of silk to be used for lake =	6.67 g		
Cut up silk thread into "fluff" using scissors. The "fluff" pieces range in size from <1mm to 2-3mm pieces			
Weight of "fluff" sample =	6.45 g		
Page 100 of "Natural Colorants":			
Extraction of dye from dyed silk			
Take 10 g cochineal-dyed silk (yarn or fabric, preferably the former), dyed using the recipe given in Chapter 4, section 4.2 and cut it very finely with scissors to give something resembling a crimson fluff as closely as possible (this takes quite a long time). Put in a 600 ml beaker and add about 300 ml of 0.1 M potassium carbonate solution (13.82 g in 1 litre demineralised or distilled water). Bring to the boil and boil gently for about 10-15 minutes or until a good extraction of the dye is obtained. This time should be adequate as alkaline extraction of cochineal dyestuff from silk usually proceeds quite quickly. The silk fibres should become almost colourless (Fig. 35). Filter off the purple-red solution (through folded filter papers) and discard the matted silk residue. Using heat, dissolve 10 g potash alum in 50 ml demineralised or distilled water (this should be more than enough to precipitate the pigment). Warm the 100 purple alkaline solution to about 50 °C (no higher) and add the alum solution very gradually, stirring, until there is no further effervescence; the pH is about 6-7 and precipitation of the purplish-red lake pigment appears to be complete. Leave to settle overnight. Next day, filter (or centrifuge) the pigment, wash and allow to dry as described in the weld standard recipe above (Fig. 36). Silk can be mordanted with an alum mordant and dyed with cochineal according to the recipe described in Chapter 4, section 4.2, adjusting the quantities accordingly. It is a good idea to wash it using a neutral soap and demineralised or distilled water before mordanting. Cochineal lakes made using this type of recipe, or that below, have amorphous hydrated alumina substrates and are a bluish crimson as powders, more crimson when bound in a drying oil (Fig. 37), although they can be more purple than crimson, particularly if the pigment is made at a higher temperature. For this recipe, it is a good idea to keep the temperature lower than that used for the other recipes.			

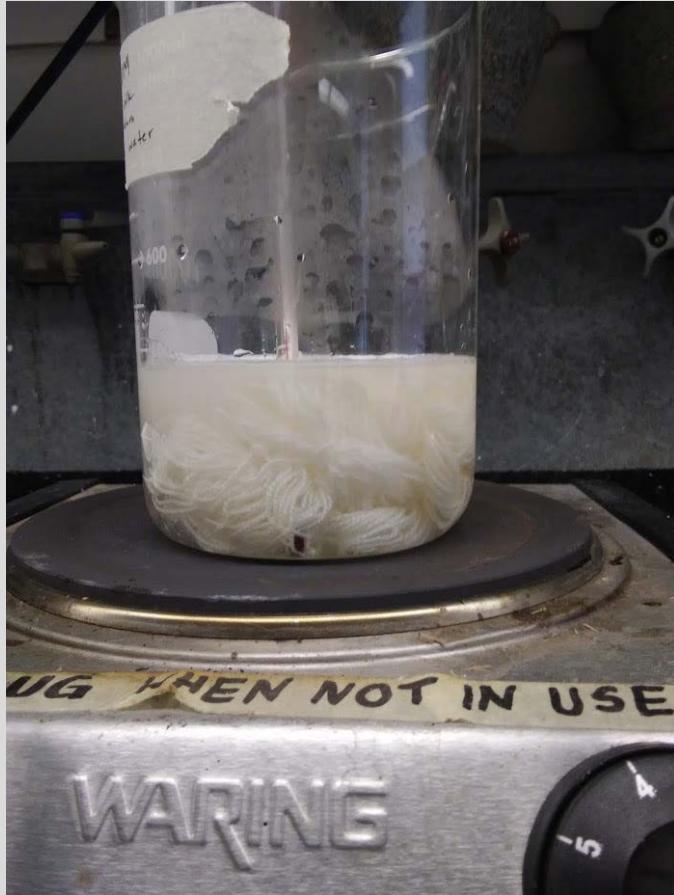
Cochineal lake from dyed silk (pg 100)			
Material	Original Amount (g)	Amount /1g textile (g)	Amount (g)
cochineal-dyed silk	10	1	6.45
0.1M potash solution	See below	See below	See below
potash	4.146	0.4146	2.67417
water-potash	300	30	193.5
alum	10	1	6.45
water-alum	50	5	32.25
0.1M potash solution			
Material	Original Amount (g)	Amount /1g water (g)	Amount (g)
potash	13.82	0.01382	4.146
water	1000	1	300
Breakdown			
Combine in beaker shredded silk and 0.1M potash solution			
Bring to a boil			
Boil for 10-15min or until silk is almost colourless			
Filter and discard the silk fibers			
In separate beaker, dissolve alum in water using heat			
Warm dye solution to about 50°C and no higher			
Add alum solution very gradually, stirring until no further effervescence (pH is ~6-7)			
Leave to settle overnight			
Filter the pigment			
Wash with water then allow to dry			
2019-03-18	Temperature (C)	Notes	
10:03 AM	20	water on heat in 600ml glass beaker on hot plate, setting 3 to start	
10:06 AM	28	potash in	
10:08 AM	35	silk in	
10:09 AM	70	started to simmer at the bottom of the beaker	
10:11 AM	80	silk looks like wet unspun wool or cotton balls	
10:12 AM	90		
10:13 AM	91	boiling	
		can start seeing that the silk is losing color. When held up against the side of the glass beaker, the silk is paler in color. When silk is held up out of the water, and the colored water starts to drain, the silk is paler in color	
10:17 AM	95		
		Solution is bubbling a lot. Big bubbles will form at the bottom of the beaker and propel the solution out of the beaker in drops. To help regulate, removing the beaker from the heat for a few seconds at a time, and lowering heat of hotplate	
10:19 AM	90		
10:22 AM	90	When the silk is held out of the water and squeezed with a finger, it is much paler in color	
10:27 AM	85		
10:29 AM	90		
10:31 AM	95	off heat	
		Filtered through coffee filter, squeezing the silk to get as much liquid out as possible.	
		Filtrate (g) =	147.77
alum sol added (ml)	pH	Notes	
4.5	12	cochineal solution brought back to heat ~90	
8	10	alum solution heated to ~50 (got almost to 60 which is not ideal)	
5	9		
4	8	Added using plastic dropper/pipet	
4	8-7		
2	7	reaction seems to have stopped. Addition of drops of alum sol do not result in further effervescence	
		Filtered using coffee filter	
		Took filtrate from first filter and put through another filter in a separate jar, as there was a lot of color in the filtrate	
Filtering and washing			
2:45 PM		Left two filters to settle and filter	
		The initial filter sample has little filtrate and is fairly clear	
		The second filter has a lot of color and, because it has had time to settle, it looks like there is pigment. Poured the filtrate back through the same filter to catch this. The resulting filtrate is not as colored or thick	
		Wash	

Preparing the dyed silk

Mordant and dye baths



Silk thread in alum mordant bath



Washed after mordant bath



Silk in cochineal bath



Silk washed and left to dry



Silk dried



Cutting up the silk to “fluff”



Cutting up the silk to “fluff”



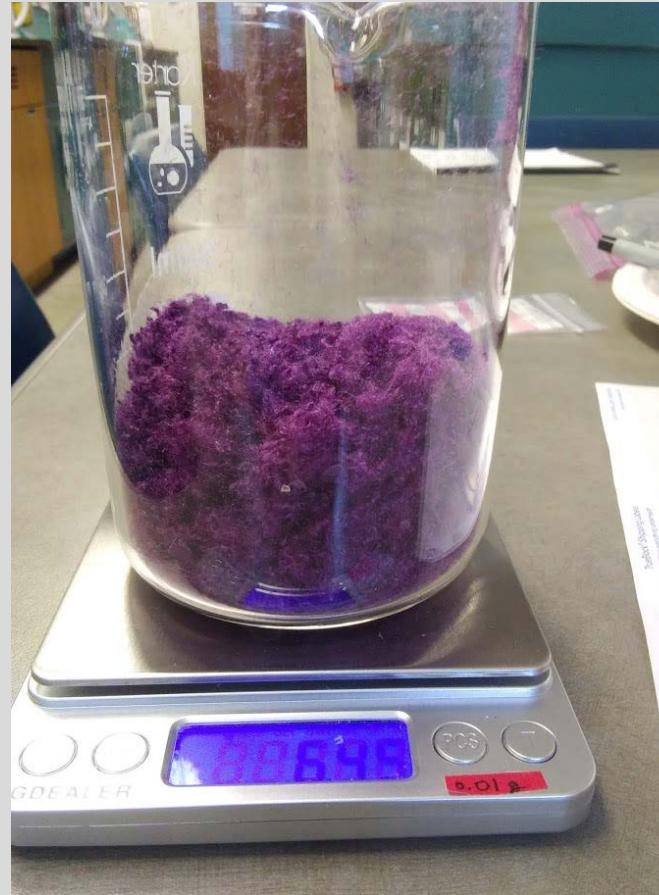
Cutting up the silk to “fluff”



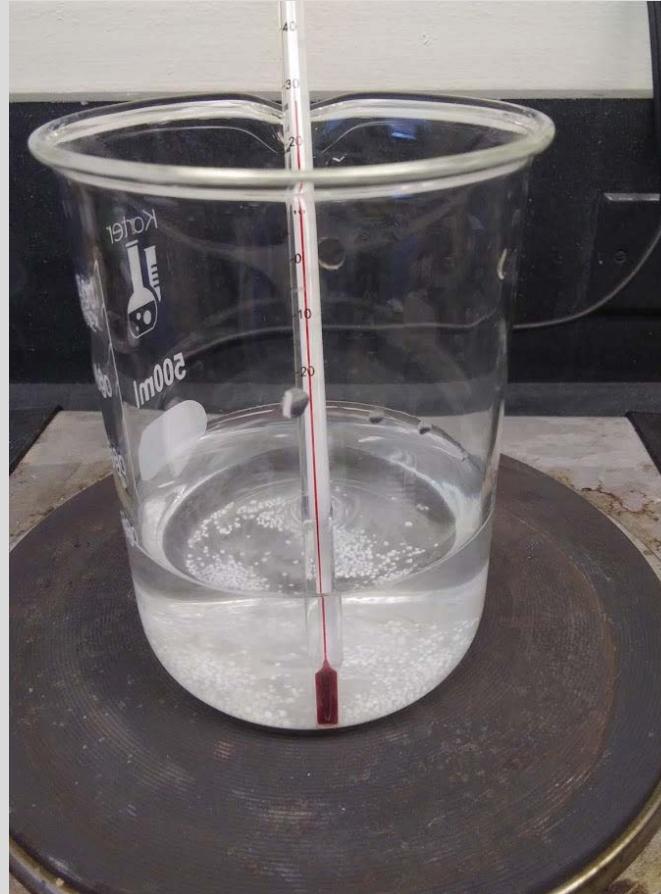
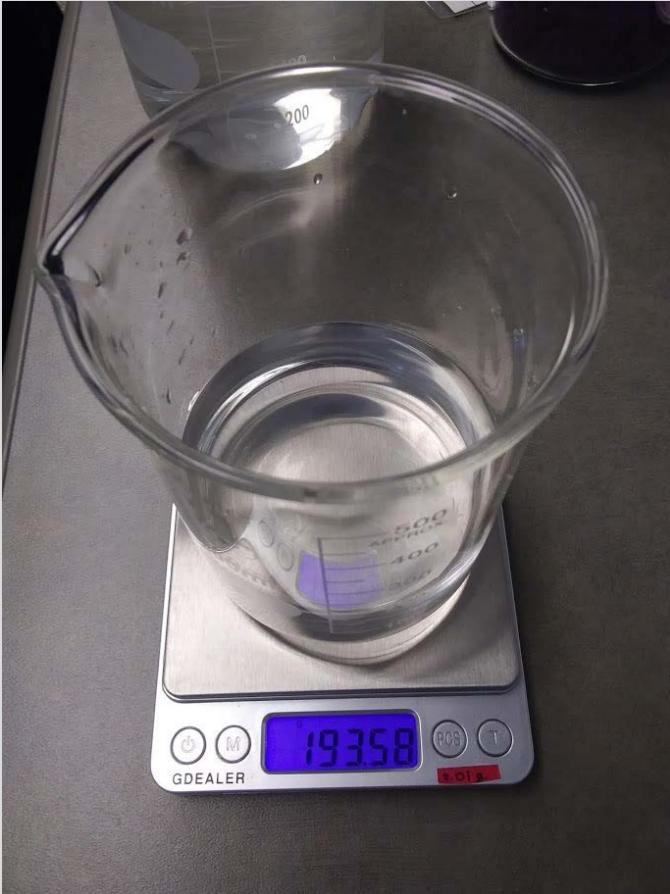
Cutting up the silk to “fluff”



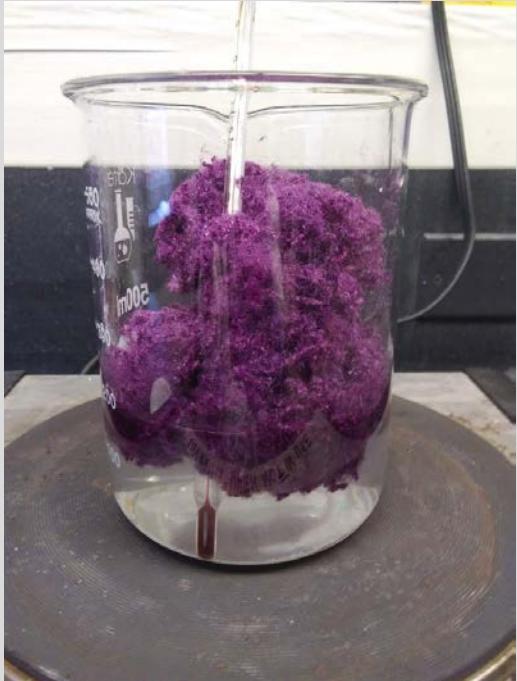
“Fluff” is weighed



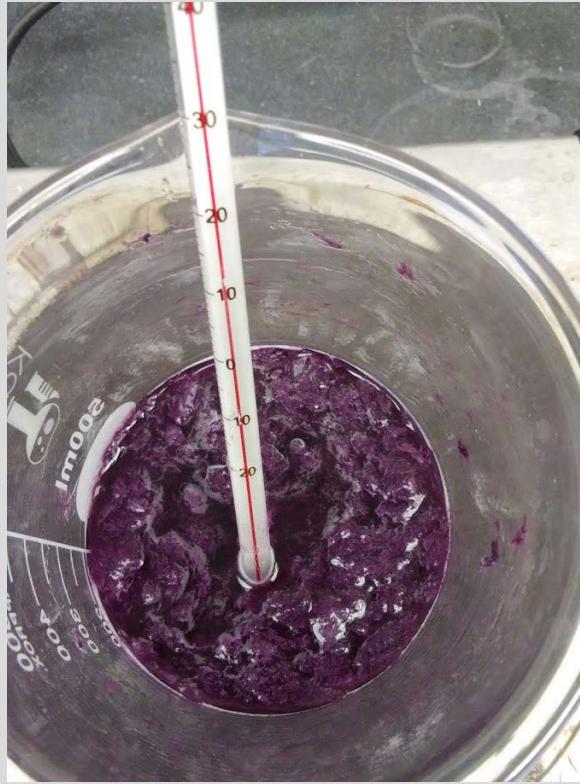
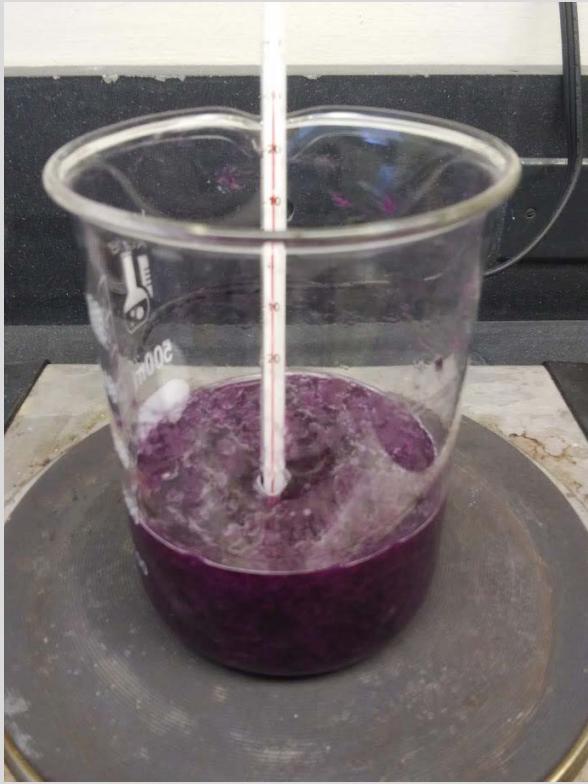
Potash solution is prepared



Silk is added to potash solution



Color extraction from silk with potash



Silk begins to lose color



Fibers are “felting” together



Silk continues to lose color as more time passes



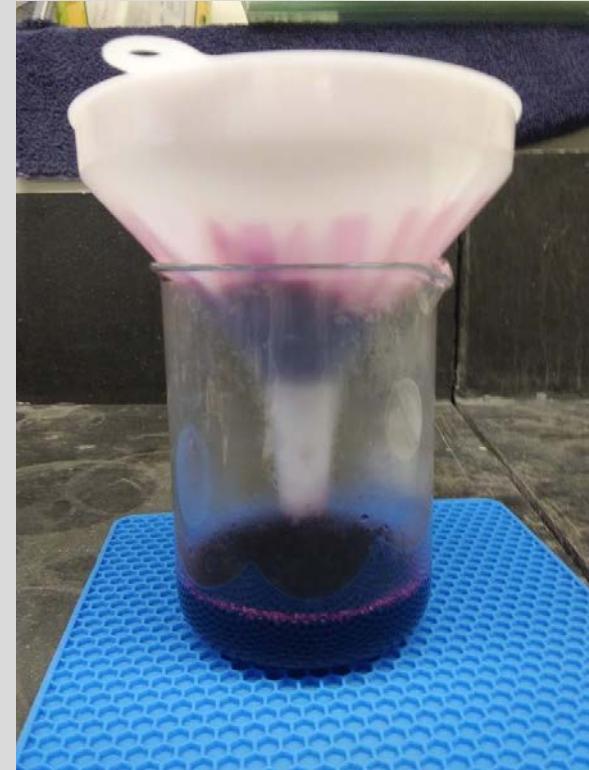
Preparing to filter



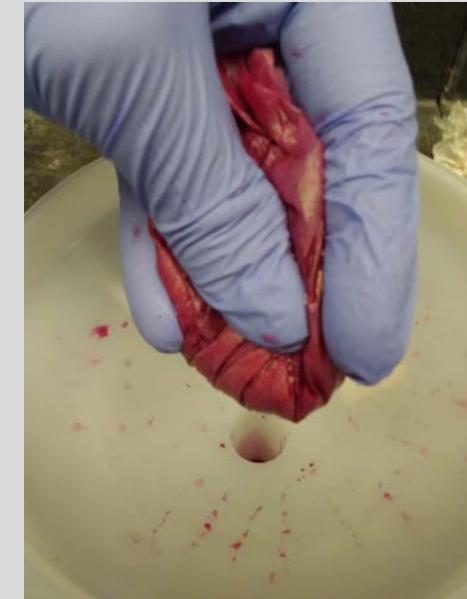
When the silk has very little color when squeezed between fingers, ready to filter



Filter using coffee filter and funnel



Squeeze fibers through filter to drain as much as possible



Fibers after filtering and squeezing



Fibers after filtering and squeezing



Teasing out the fibers



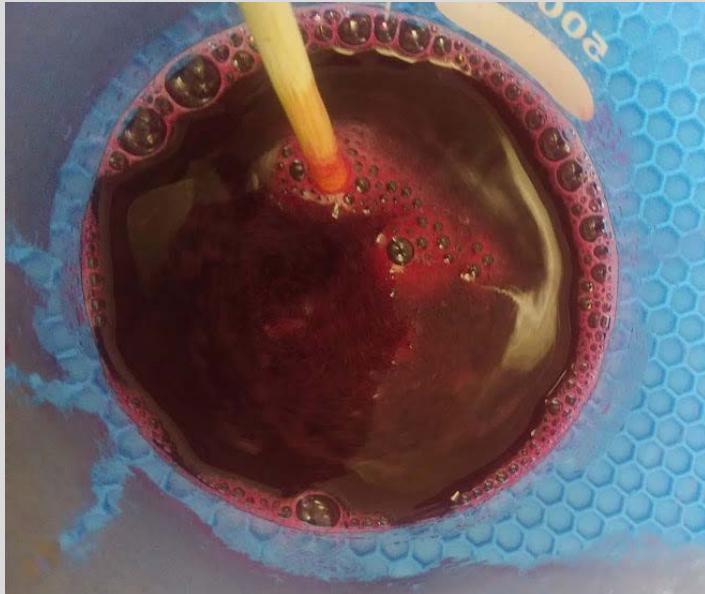
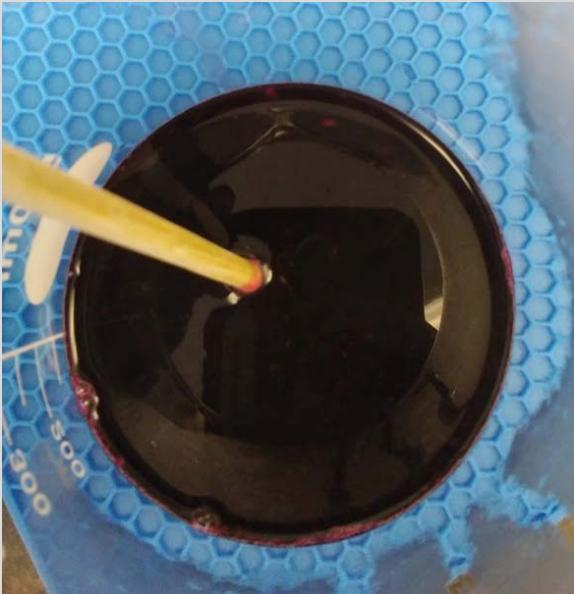
Preparing the lake pigment

Extracted pigment filtrate from silk and alum solution



Alum solution is gradually added to cochineal

alum sol added (ml)	pH	Notes
	12	cochineal solution brought back to heat ~90
	3	alum solution heated to ~50 (got almost to 60 which is not ideal)
4.5	12	Added using plastic dropper/pipet



Effervescence begins

Effervescence

alum sol added (ml)	pH	Notes
8	10	



Effervescence

alum sol added (ml)	pH	Notes
5	9	



Effervescence



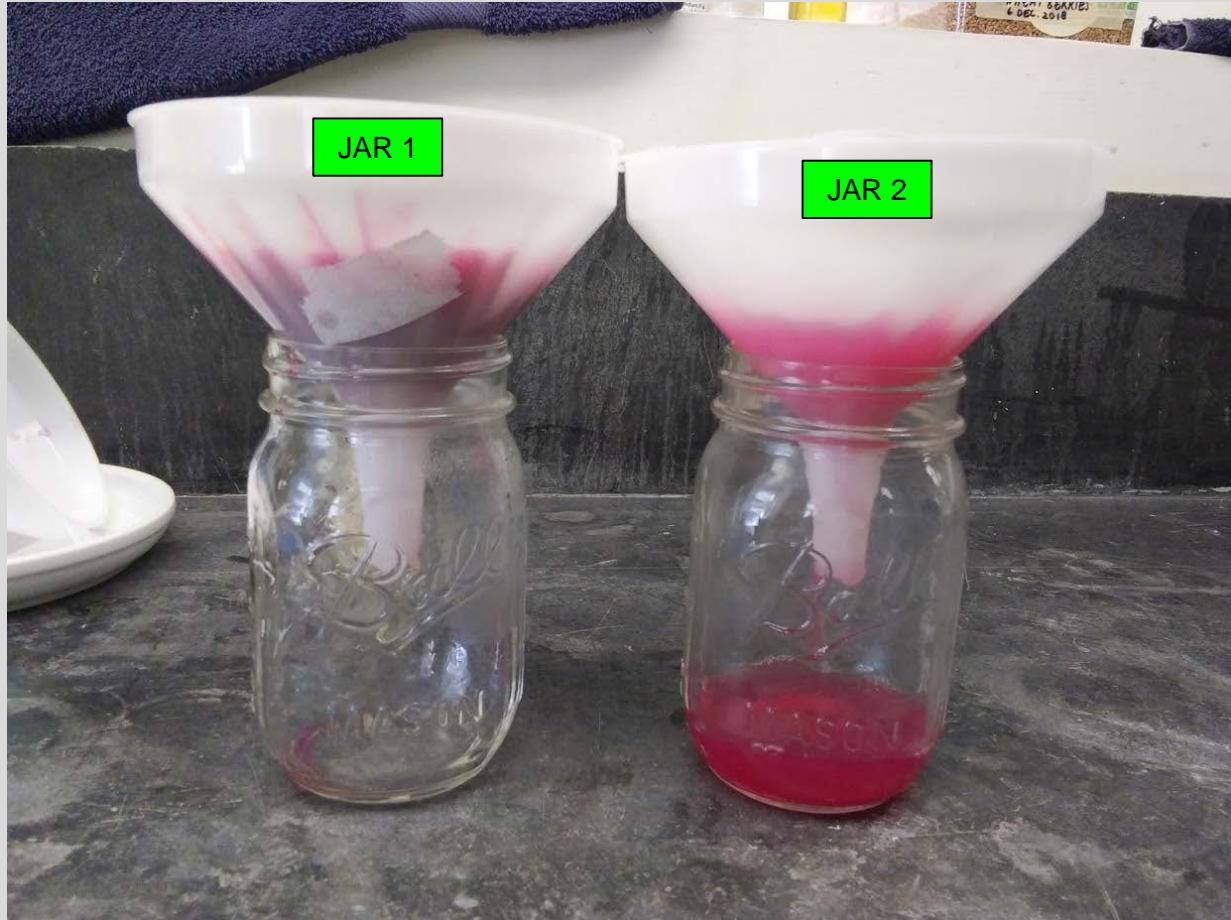
alum sol added (ml)	pH	Notes
4	8	

Effervescence

alum sol added (ml)	pH	Notes
4	8-7	
2	7	reaction seems to have stopped. Addition of drops of alum sol do not result in further effervescence



Filter using coffee filter and funnel



Filter using coffee filter and funnel



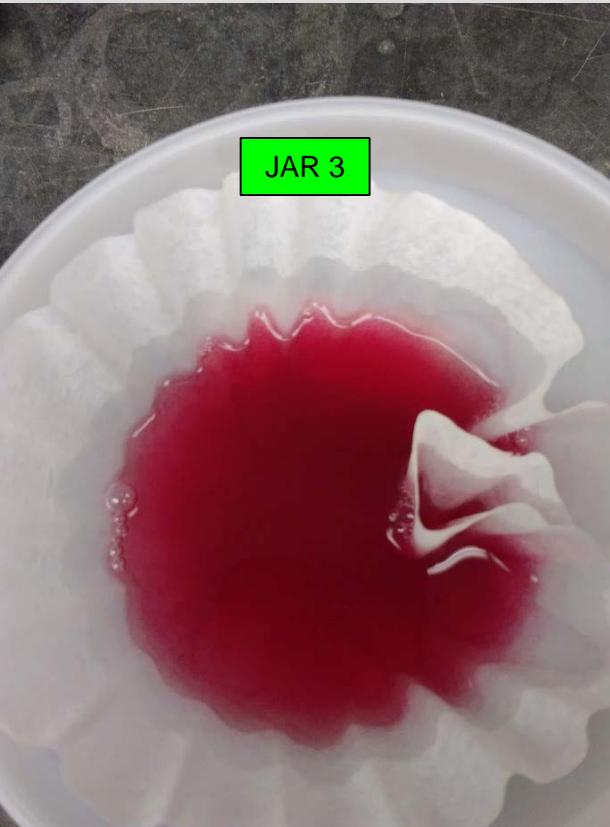
Filter using coffee filter and funnel



Filter using coffee filter and funnel



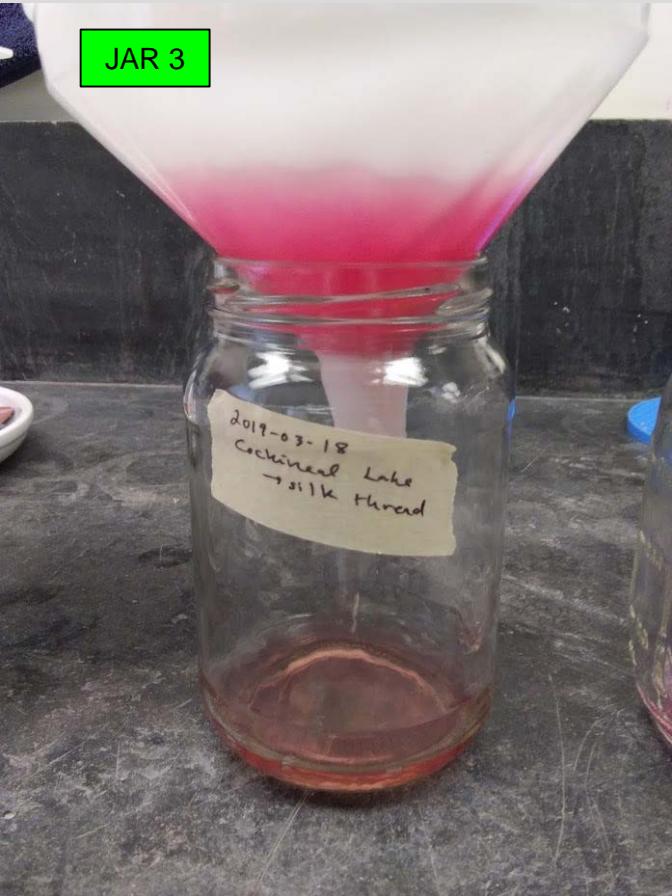
Filtrate is still pigmented - filter again



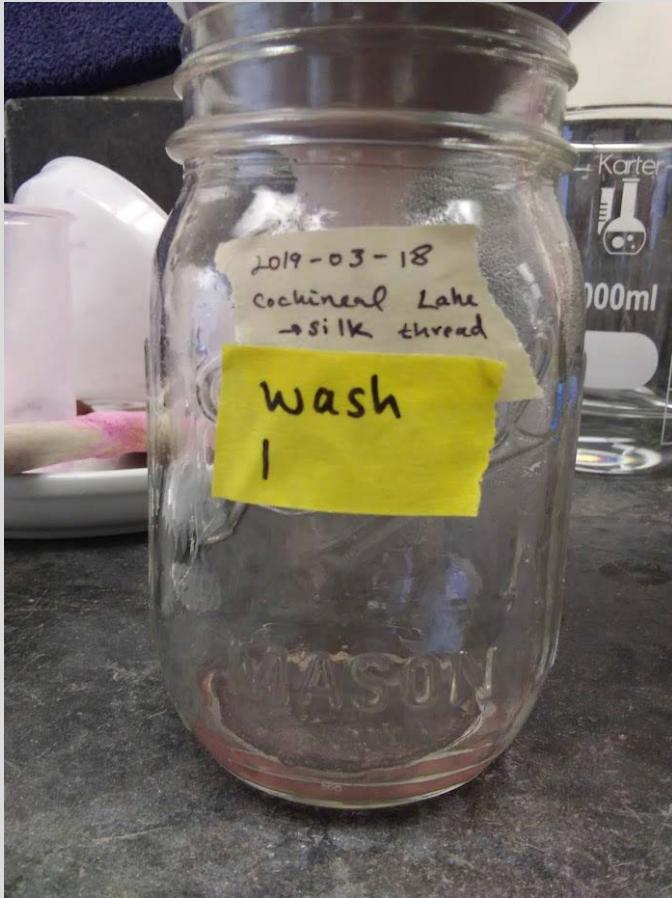
Filtrate is still pigmented - filter again



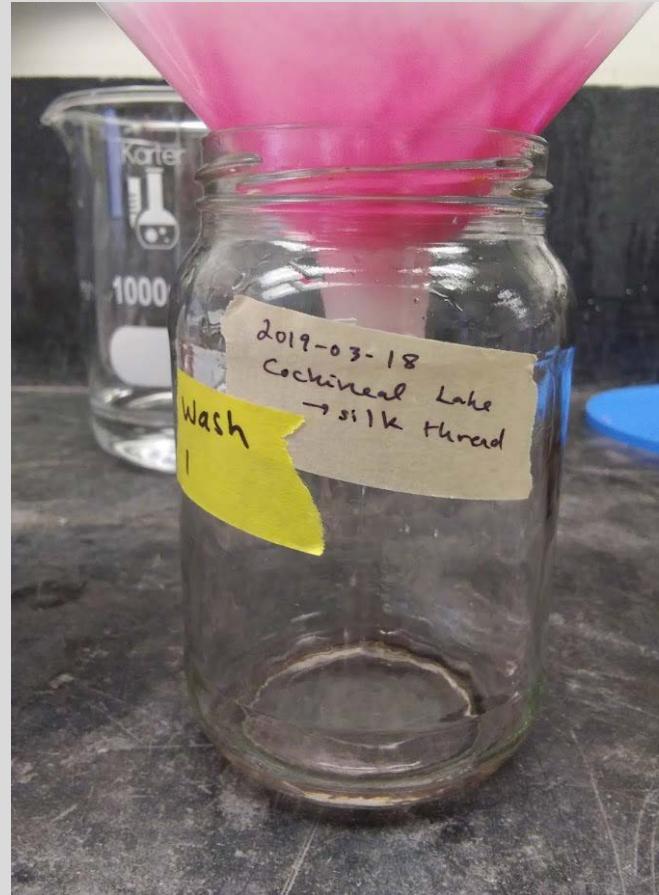
Filtrate is still pigmented - filter again



Wash the pigment with water



Wash the pigment with water



Leave to dry



Leave to dry



Leave to dry



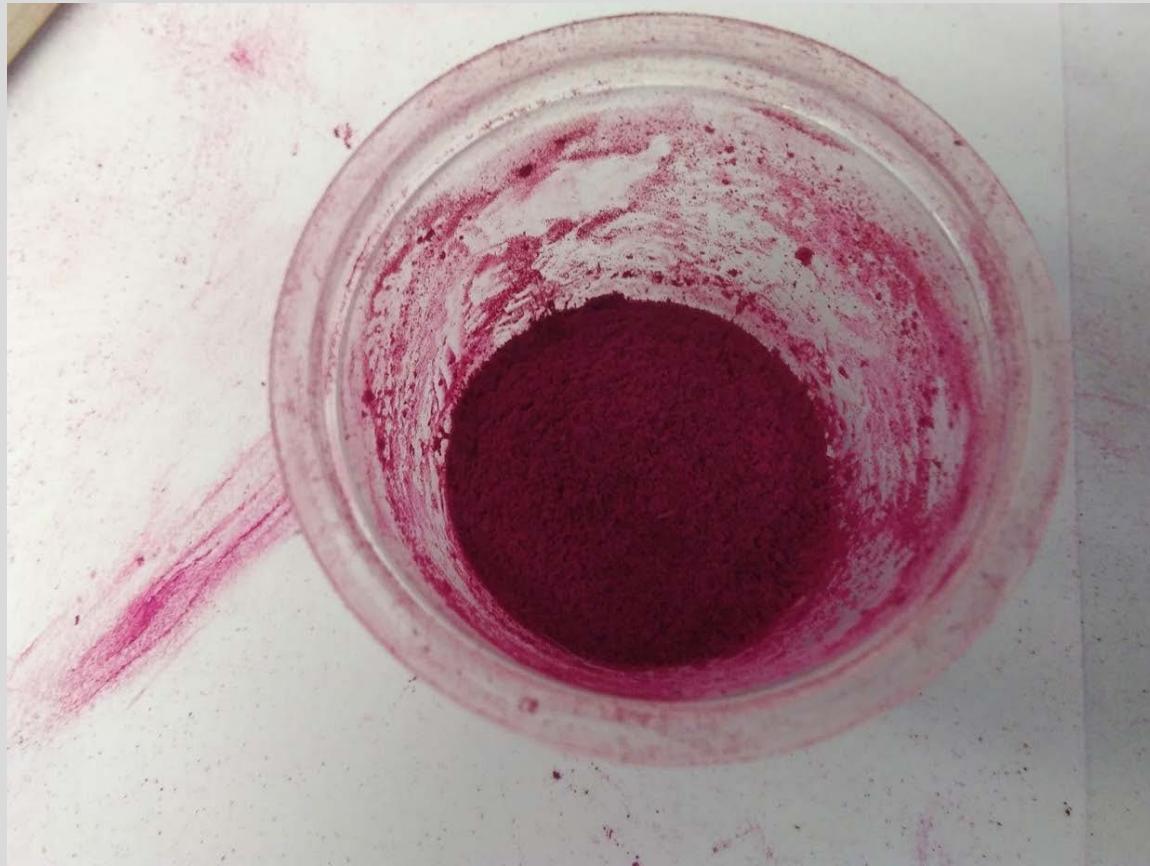
Removing pigment from filter (using medium-hard brush with fine bristles)



Removing pigment from filter (using medium-hard brush with fine bristles)



Grind in mortar and pestle



Grind in mortar and pestle



SP19 painting out lakes in binding media

See also linked field note presentation