

## LAKE PIGMENTS FROM WELD

*NOTE: This protocol is quite forgiving. Your measurements do not need to be ultra-precise to produce a pigment, though variations in the quality of materials, amounts, temperature, technique, and time can produce differences in color from batch to batch.*

RECIPE: STANDARD	
<b>EQUIPMENT</b> 1 hot plate 1 mortar and pestle 1 digital scale 1 large beaker (1 L) 1 small beaker (250 ml) 1 large jar (to catch the filtrate) 1 drawstring filter bag 1 pair of chopsticks 1 thermometer 1 potholder pH test strips 1 funnel 1 filter (or more, if necessary) 1 dull blade (i.e., palette knife) or stiff brush 1 oz plastic container with lid	<b>MATERIALS</b> 480 ml water (for soaking + potash (large beaker)) 140 ml water (for alum (small beaker)) 8 g weld 24 g alum (aluminum potassium sulfate) 8 g potash (potassium carbonate)

### Procedure:

- If weld is not already broken into small pieces, grind coarsely with a mortar and pestle.
- Enclose weld in filter bag large enough for material to move freely and water to penetrate it. Close the bag and tie tightly so no particles can escape through its opening.
- Put 480 ml water in 1 L beaker and add the weld bag.
- *Optional:* Soak overnight.
- Bring to a boil and extract dye at this temperature for 30 min.
- Meanwhile, in 250 ml beaker, dissolve 24 g alum in 140 ml water using heat. Set aside for later.
- After extraction of dye in the large beaker, remove and discard weld bag.
- *If necessary:* filter dye solution through filter paper to remove particles.
- Add 6 g potash to dye solution and, if temperature has dropped during filtering, heat to 80 °C.
- Remove from heat.
- Pour the alum solution into the dye solution slowly and incrementally, stirring constantly.
  - Check the pH repeatedly as you add the alum solution.
  - Keep adding alum solution to dye until a pH of 6-7 is achieved, there is no further effervescence, and precipitation of the lake pigment appears to be complete.
- Allow the solution to settle for at least 15 min (ideally overnight).
- Pour solution through filter in a funnel. What remains in the filter is pigment. Discard filtrate.
- Wash pigment, pouring batches of clean water through pigment in the filter until filtrate runs clear, discarding filtrate.
- Allow the pigment to dry thoroughly on the filter (at least overnight, perhaps longer if thick).
- Using a dull blade or stiff brush, carefully remove pigment from filter. Collect pigment in small container and secure lid.

TIMING			
DAY 1	DAY 2	DAY 3	DAY 4
<ul style="list-style-type: none"> <li>- Crush weld and leave to soak overnight</li> <li>- Cleanup</li> </ul>	<ul style="list-style-type: none"> <li>- Bring to boil and prepare work area, materials (~30 min)</li> <li>- Extract dye (~30 min)</li> <li>- Add potash and heat to 80°C (~10 min)</li> <li>- Add alum solution to precipitate (~10 min)</li> <li>- Leave to settle</li> <li>- Cleanup</li> </ul>	<ul style="list-style-type: none"> <li>- Filter</li> <li>- Wash multiple times</li> <li>- Cleanup</li> </ul>	<ul style="list-style-type: none"> <li>- Scrape dried pigment into container for later use</li> <li>- Cleanup</li> </ul>
Schedule time: ~20 min	Schedule time: ~90 min	Schedule time: ~1 hour	Schedule time: ~20 min

*NOTE: Overnight soak (i.e., Day 1) is optional. Activities do not need to take place on successive days.*