

# Pure Tinctoria

## Dyes with a heart

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## I. Using Pure Tinctoria Dyes

*Pure Tinctoria Dyes are suitable for fibers in their unspun, spun, or knit/woven state. In the directions below, we will refer to them collectively as “fiber.”*

*Before you begin, we recommend keeping notes on your dyeing, for example the weights of dry fiber, dry dye, mordant, etc. Keeping these records as accurately as possible will allow you to repeat the process to achieve similar results at a later stage. In the directions below, we use the word “**record**” to indicate a place where notes should be taken.*

*The depth of shade you may obtain using these dyes depend on the percent of the dry to the fiber used. As a guideline, we find that for deep colors, a 5% dye to fiber ratio is needed, for example:*

*5 g of dry dye to 100 g of dry fiber  
-OR-  
0.2 oz. of dry dye to 4 oz. of dry fiber*

*For pale colors, a 2% dye to fiber ratio is appropriate, for example:*

*2 g of dry dye to 100 g of dry fiber  
-OR-  
0.1 oz. of dry dye to 5 oz. of dry fiber*

*Have fun coloring your world!*

### **I.a. Dyeing Directions: (these directions are not appropriate for Indigo; see the next section)**

1. Weigh (and **record**) your dry fiber.
2. Wet and wash the fibers. If a mordant is needed, follow the mordanting directions below (**record** the procedure used).
3. In a small container, add the required amount of dry dye (**record** the weight used). Add a little warm water and mix into a paste.
4. Add some water to a dye pot and add the dye paste. The water should be enough to just cover the fiber, so you may have to adjust the amount after the fiber is added.
5. Place the wet fiber into the dye pot and, if needed, carefully add some water to cover the fiber. Bring the pot to a simmer (about 180 °F for wool and silk, 170 °F for cotton and linen). Gently press (**do not stir**) the fibers into the dye pot to ensure good contact between the dye and the fiber.

6. Maintain the simmer for 30 minutes to 1 hour (or more) to allow the color to develop to your specifications (**record** the amount of time you actually simmer the mixture), testing every 15 minutes or so.

*Test the color by removing a small amount of fiber, letting it drain, then (while wearing thick rubber gloves) gently squeezing out most of the excess liquid. This will give a reasonable idea of the color but will dry to be a little lighter in shade.*

7. Remove the fibers from the dye pot, squeeze excess liquid back into the dye pot. Wash and rinse thoroughly.

## II. Dyeing with Indigo

*Indigo dye is a little different than the other natural dyes in that it has to be chemically altered before it can be used. This is done using a class of chemicals known as “reducing agents.” Several of these chemicals are available, for example sodium bisulfite, but we have found it convenient to use Spectralite (thiourea dioxide) as the reducer.*

*The method described below produces a dye bath that can be used several times, although the depth of color may vary as the dye is exhausted. Once it is completely exhausted, it is time to make a new dye bath! The exhausted dye bath should be well aerated (stirring vigorously should do it) before it is poured down the drain.*

*As with the other dyes, a 5% dye mixture (deep color) contains 5 g of the dye for every 100 g of the fiber, and a 3% dye mixture (lighter color) has only 3 g for every 100 g of fiber.*

### II.a. Indigo Dyeing Directions:

1. Dissolve 1 teaspoon of washing soda in about 4 tablespoons of hot water.
2. Add the appropriate amount of indigo dye powder (**record**) to the water from step 1, and combine it well to form a smooth paste. You may need to add more water to make sure the indigo has dissolved.
3. Heat a pot of water (1 gallon or so) to 100-120°F. Stir in the indigo paste. The mixture should appear dark blue with hints of green or brown. Maintain this temperature!
4. In a separate jar, dissolve 1-2 tablespoons of Spectralite powder in warm water.
5. Add the dissolved Spectralite to the dye pot, stir and cover. The dye pot should be left until it takes on a yellow color. This can take anywhere from 15 minutes to an hour, so be patient! If the color does not change after an hour, you can try adding more spectralite.

6. Once the color has changed, add the clean and wet fiber to the dye pot. No mordanting is necessary for indigo. Gently push the fiber (**do not stir**) under the surface of the liquid.
7. The fiber should stay submerged for anywhere from 5 to 25 minutes or more (**record**), depending on the depth of shade desired.
8. Once the soak-time has elapsed, carefully remove the fiber, and let it get exposed to the air. The color should change from yellow to blue as the dye is reoxidized. The fiber should remain in the air for about the same amount of time it was in the bath.
9. For a deeper color (especially for cotton and silk), repeat steps 7 and 8.
10. Once the color is acceptable, thoroughly rinse and wash the fiber, and allow to dry.

*Because indigo needs the washing soda and the reducing agent, several things can go wrong in this process. It is helpful to know several of the problems that can arise:*

- a. Adding too much or too little washing soda – the indigo will not form properly.
- b. Heating the dye pot above 120°F – the indigo will become ruined.
- c. The dye bath is left too long between uses – the yellow color will not come back when more Spectralite is added.

### **III. Mordanting**

*Mordants allow the dye's color to set permanently to the fiber. There are two kinds of natural dyes: substantive and adjective. **Substantive** dyes (rhubarb root and walnut hulls, for example) need no mordants to help the dyes adhere to the fiber. On the other hand, **adjective** dyes do. Adjective dyes are not able to penetrate the fiber enough to adhere to it unless a mordant is used.*

*We recommend using environmentally safe mordanting agents, such as alum or mordant dyes (Oak Gall, Myrobalan, Pomegranate, and Cutch). For basic instructions on mordanting with alum, iron, and copper, see directions below. Please see the resource section at the end of these instruction sheets for our recommended books on natural dyeing.*

***Even though the mordants described here are safe, you should always handle them with care. Wear rubber gloves, cover pans, and work in a well-ventilated area.***

*The methods described below all give good results. However, the mordanting process can be improved by allowing the mordants to cure for up to 3 days before using.*

*It is also possible to mordant the fibers and dry them well in advance of the dyeing process. Mordanted yarns and material can be stored indefinitely for use at a later date. The mordanted fiber only needs to be re-wet before it is added to a dye pot.*

*Weighing small quantities of mordants can be difficult, so it is sometimes useful to dissolve a larger quantity in water, and use an appropriate volume of the mixture as needed. For example, you can dissolve 100 g of alum in boiling water and add cool water to make up to 1 liter. Every 10 mL of this solution contains 1 gram of alum.*

*In the next section, we describe “Color-Modifying Mordants.” These additives change the dyes natural colors.*

### **III.1. Mordanting Wool, Silk, and Other Protein Fibers Using Alum and Cream of Tartar**

*Always use clean fibers before dyeing or mordanting.*

*The addition of the cream of tartar to the alum increases the amount of alum that is taken up by the yarn, leaving the bath almost free of aluminum. Use the ingredients in the following proportions:*

*8% alum  
7% cream of tartar.*

*For example, use 8 g of alum and 7 g of cream of tartar to 100 g of fiber.*

#### **III.1.a Directions:**

- 1 Fill a clean pot with cool water.
- 2 In a separate container, dissolve the cream of tartar in boiling water and add to the pot. Repeat with the alum in the same pot.
- 3 Stir well, then add the yarn, bringing slowly to a simmer (180 °F to 190 °F) for 1 to 1 ½ hours.
4. Leave to cool, then rinse.

### **III.2. Mordanting Cotton, Linen, and Other Cellulose Fibers Using Alum and Washing Soda**

*Always scour the cotton before mordanting, by boiling it for 45 minutes in water with 1 handful of washing soda and a small amount of liquid detergent. Rinse well.*

*The ingredients should be used in a 25% alum/ 6% washing soda to fiber ratio. For example, use 25 g of alum and 6 g of washing soda to 100 g of fiber.*

### **III.2.a. Directions:**

1. Fill a pot two-thirds full with hot water. Add the alum, stirring well, until it is dissolved.
2. Dissolve the washing soda in a little hot water, and add this slowly to the alum. The mixture may start bubbling as carbon dioxide is released. Wait until the bubbling subsides before proceeding.
3. Add the wet cotton and slowly bring to a simmer (130 °F to 170 °F).
4. Turn off the heat and leave the cotton to steep overnight.
5. Rinse well before dyeing.

## **IV. Color Modifiers**

*The range of colors that are achieved using natural dyes may be expanded by using color-modifying mordants. In some cases, simply changing the alkalinity or acidity of the dye bath can give dramatic changes.*

### **IV.1. Iron Water**

*Iron water can be easily made and used as a mordant or color modifier for both protein and cellulose fibers. Iron tends to improve the fastness of most dyes, as well as dulling them.*

*To make iron water, put rusty nails or pieces of rusty iron in a large glass jar or plastic container with a lid, fill with a solution of 1 parts water and 1 part white vinegar. Let steep for 2 to 3 weeks. To maintain your supply, keep topping up the liquid in the container with water and vinegar.*

***Iron is a poison if ingested, so handle with care.***

### **IV.1.a. Mordanting Directions:**

1. Wet the fiber and place it in a clean pot. Cover the fiber with iron water.
2. Heat to simmer (150-180 °F), and keep fiber in the pot for 45 minutes.
3. Allow fiber and mordant to cool in the pot. Remove the fiber, and return the liquid to the iron water container.

#### **IV.1.b. Color Modifying Directions:**

1. Add a quantity of iron water and then add the pre-dyed materials and simmer for 10 mins.
2. Repeat with more iron water to achieve the desired color.

#### **IV.2. Copper Water**

*Copper water can be easily made and used as a mordant or color modifier for both protein and cellulose fibers. Copper tends to make dyes either greener or browner, and it also improves the fastness of most dyes.*

*To make copper water, place a piece of a copper pipe in a large glass jar or plastic container with a lid, fill with a solution of 2 parts water and 1 part white vinegar. Let steep for 2 to 3 weeks. Keep topping up the liquid in the container with water and vinegar to maintain a constant supply.*

***Copper is a poison if ingested, so handle with care.***

#### **IV.2.a. Mordanting Directions:**

1. Wet the fiber and place it in a clean pot. Cover the fiber with copper water.
2. Heat to simmer (150-180 °F), and keep fiber in the pot for 45 minutes.
3. Allow fiber and mordant to cool in the pot. Remove the fiber, and return the liquid to the copper water container.

#### **IV.2.b Color Modifying Directions:**

1. Add a quantity of copper water and then add the pre-dyed materials and simmer for 10 mins.
2. Repeat with more copper water to achieve the desired color.

#### **IV.3 Acidic Modifiers**

*Citric acid is a modifier that yellows certain dye colors. Lemon juice may be used, but citric acid crystals are cheaper in the long run.*

1. Dissolve 1 tablespoon of citric acid crystals in 1 liter of boiling water.
2. Add one or two teaspoons of the citric acid solution (from step #1 above) to a pot of water. Add the dyed fiber.

3. Heat to simmer (150 °F to 180 °F) for 5 to 10 minutes. Remove the fiber as soon as the color change you desire is achieved. (Alternatively soak the fibers in a cool solution until the color change you desire is achieved.)
4. Rinse well and wash in a pH neutral washing liquid.

#### IV.4 Alkaline Modifiers

*Washing soda is an alkaline modifier that gives colors a pinker tone.*

1. Dissolve 1 tablespoon of washing soda crystals in 1 liter of boiling water.
2. Add one or two teaspoons of the washing soda solution (from step #1 above) to a pot of water. Add the dyed fiber.
3. Let the fiber soak until the color change you desire is achieved.
4. Rinse well and wash in a pH neutral washing liquid.

#### V. Natural Dyeing Resources

Bechtold, Thomas, Mussak, Rita, Editors, **Handbook of Natural Colorants**, 2009, Wiley, UK, 412pp, ISBN: 978-0-470-511992

Buchanan, Rita, **A Dyer's Garden**, 1995, Interweave Press, Loveland, CO, 112pp, ISBN: 1-883010-07-1

Cardon, Dominique, **Natural Dyes: Source, Tradition, Technology and Science**, 2007, Archetype Publications, Ltd., London, 778pp, ISBN-13: 978-1-904982-00-5

Dean, Jenny, **Wild Colors**, 1999, Watson-Guptill Publications, NY, NY, 144pp, ISBN: 0-8230-5727-5

Liles, J.N., **The Art and Craft of Natural Dyeing, Traditional Recipes for Modern Use**, 1990, The University of Tennessee Press, Knoxville, TN, 222pp, ISBN: 0-87049-670-0