

CYANOTYPE TONING

THEORY : There are three types of chemicals that affect Cyanotype prints. These chemicals can be used individually or in combination. One simple approach is the **bleach** the color out of an overly dark print. Another is to **intensify** the color of a normal print. A third is to **alter** the tone of the pigment. And then there are a slew of combinations, detailed below.

- **Reducers** – act as bleaches, degrading the blue color in the print
Sodium Carbonate, Borax, Ammonia, Developer...
- **Intensifiers** – deepen the color of the print
Hydrogen Peroxide, Lemon Juice, Citric Acid, Vinegar...
- **Toners** – chemically change the color of the iron in the print
Tannic Acid, Oolong Tea, Wine, Cat Urine, Pyrogallic Acid...

With Silver prints, a common practice is to bleach the color out of the silver and then re-develop the print in either Sepia or another Developer. This same technique can be preformed by combining a bleach step with a toner step. The most common combo for Cyanotype is Sodium Carbonate (Laundry Detergent) and Tannic Acid (strong Black Tea).

Many of these recipes can be used in either direction, or repeatedly back and forth, each time producing a different tone. And each time you print, different tones may result.

Changes can be very subtle to very extreme. It is possible to render cyanotypes dark blue to chocolate brown or even black with many shades in between. Experimentation and careful note taking are important to be able to produce consistent results.

MATERIALS:

The toning of cyanotypes can happen at home just as easily as in a lab. The materials can all be purchased at your local supermarket and can be poured safely down the drain when done. If you prefer stronger or more 'official' chemicals, all the ingredients can be purchased from photographic chemical supply houses, most notably:

Photographer's Formulary www.photoformu.com
Bostick & Sullivan www.bs.com

- **Reducers** –
supermarket : Laundry Detergent with active ingredient Sodium Carbonate, Borax Laundry Detergent, White Ammonia,
photo chemical supply: Print Developer
- **Intensifiers** – deepen the color of the print
supermarket: Hydrogen Peroxide, Lemon Juice, Vinegar
photo chemical supply: Citric Acid
- **Toners** – change the color of the iron in the print
supermarket: Oolong Tea, Wine, (Cat Urine (behind the market?))
photo chemical supply: Tannic Acid, Pyrogallic Acid

photo chemical supply:

PRACTICE :

General Considerations:

Overexpose prints to be toned by at least one stop (until the highlights are gray).

warning: highlights lost during reduction can never be regained!

Prints should cure at least one day after printing before toning.

Soak the prints in distilled water before you start toning.

Do a final wash for 10 ~ 15 minutes in running water at the end.

Replace the chemicals as soon as they start to get dark (10 ~ 15 prints per tray).

Always rinse between chemicals to increase toner life by about 5 prints per tray.

Always add chemicals to water, never the other way around.

CYANOTYPE TONING

BASIC RECIPES :

BLEACHING ONLY produces a subtle yellow/blue split, [reduction]

SODIUM CARBONATE OR LAUNDRY DETERGENT

Sometimes, just bleaching a print can produce a good result. This is a common practice with silver prints. It works better if the print is at least **one stop darker** than normal.

mix _____ a bleaching solution of Sodium Carbonate Washing Powder
(1 TB per quart of WARM water)

immerse the print _____ for 2 seconds to 30 seconds

pull the print _____ quickly from the Bleach and
watch the split tone happen in the air over the tray
if you wait for it to look right in the chemical tray,
it will be over-bleached by the time you get it out

rinse _____ for 15 minutes in running water

produces a subtle yellow/blue split,

warning: longer goes more yellow but only if the image doesn't disappear first!

note: Borax Landry Detergent can also be used, with a slightly different effect

warning: Clorox household bleach can remove Cyanotype completely

INTENSIFIER for CONTRAST CONTROL [intensification]

LEMON JUICE OR VINEGAR

Acid will intensify the density of the Prussian Blue. Citric or Acetic acids will work fine and are commonly available products, e.g. lemon juice, orange juice or vinegar (stinky).

add _____ 1.5 oz. Lemon Juice or Vinegar (supermarket variety)
to 1 qt of water to make a small tray of Intensifier

vary the dilution _____ for more or less effect

bathe prints _____ for 30 seconds only

wash _____ in plain running water for 15 minutes

re-mix _____ this solution often as it becomes exhausted quickly

OXIDIZER for FINAL TONALITY [intensification]

HYDROGEN PEROXIDE

Prints will not reach their full density until they are dry (usually overnight). This is because it takes time for the Sensitizer to oxidize in the air. It is possible to force an immediate oxidation of the prints by rinsing for about 1 minute in a bath of dilute Hydrogen Peroxide. This brings prints to their full intensity. While not necessary, this will provide 'immediate gratification'.

add _____ 1 – 2 TB Hydrogen Peroxide (drugstore variety)
to 1 qt of water to make a small tray of 'Oxidizer'

immerse the print _____ for 1 minute

wash _____ for 15 minutes

Hydrogen Peroxide Oxidation can be used as the **final step in all toning processes** mentioned below.

CYANOTYPE TONING

TEA TONING

[toner]

BLACK TEA OR TANNIC ACID

Where Tea toning with silver prints is a dyeing effect, the tannic acid in tea actually has a chemical reaction with the iron in the cyanotype to cause a change in color. The tannic acid in the tea reacts with the ferric ferricyanide (iron) to produce ferric tannate that is very archival. [*ferric ferricyanide (iron) + tannic acid (tea) = ferric tannate*]

A short immersion in tannic acid will reduce the edge of the Prussian blue color to a navy blue. Longer processing will take the print into the brown range and finally to an almost black color. After a while the tea will stain the paper itself. This produces a warm-tone base, not unlike some of the warm-tone papers used for regular silver printing. This tone combines well with the darker and warmer color of the cyanotype.

Immerse the print in a strong tea, preferably an inexpensive black tea. Tannic Acid powder can also be used, as well as the Cyanotype Toning Kit Solution B from Bostick & Sullivan.

It is best to make up a small batch of strong tea every other print or so.

Then make another strong batch for the next two prints, and so on. The results will be much more consistent and intense.

brew some tea _____ pour 1 quart of boiling water over at least 5 tea bags
let it steep at least 5 minutes
use black tea, such as Oolong Black Tea or standard Orange Pekoe

or-

mix _____ Tannic Acid in a tray of water

immerse the print _____ in the tea

the initial effect will be to reduce the intensity of the blue color
to a navy blue

further toning will eventually turn the blue into a blue-black

the paper will also become stained by the tea

the length of the toning and the brand of paper

determine the color, ranging from light beige to a strong brown

MULTI-STEP RECIPES:

BLEACH & TEA TONING

[reduction then toner]

SODIUM CARBONATE > TANNIC ACID

This involves 'bleaching' the print first, then 're-developing' in tea. This is the same basic process as bleaching and sepia toning silver prints. The finished print consists of ferric tannate. This is a permanent pigment and is very stable.

mix _____ any of these bleaching solutions

sodium carbonate (1 TB per quart of water)

borax (1 TB per quart of water)

ammonia (8 Oz. per quart of water) *noxious and unpleasant*

rinse _____ a dry / aged print for 5 minutes

immerse the print _____ in the 'bleach'

until before the desired amount of color has been removed

remove the print for the tray and watch it continue to lighten

immerse in water when the print reaches the desired tonality

redevelop in tea _____ or other chemical toner

black tea 5 tea bags in 1 quart of water

let it steep at least 5 minutes

a new color will be imparted to the Cyanotype emulsion,

a brown-back color rather than the original Prussian Blue

CYANOTYPE TONING

REPEATED BLEACH & TEA TONING

[reduction then toner]

SODIUM CARBONATE > TANNIC ACID > (SODIUM CARBONATE)> (TANNIC ACID)> . . .

Continue to process the print further after using the bleach + tea tone steps above

tone further _____ with other chemicals (optional)

rinse briefly in sodium carbonate (1 TB in 1 quart of water)

produces a red-brown color

then back into strong tea for 5 minutes

produces a licorice blue/black/red

re-immerses in sodium carbonate, and so on, back and forth

each time producing a different color

just be careful not to lose the highlights after too much bleaching

REVERSE TEA TONING with BLEACH

[toner then reduction]

TANNIC ACID > SODIUM CARBONATE > (TANNIC ACID)> . . .

This involves 'toning' the print with tea first, then 'bleaching' the print. This might sound illogical, but a different chemical process takes place and produces different results.

mix _____ any of these bleaching solutions

sodium carbonate (1 TB per quart of water)

borax (1 TB per quart of water)

ammonia (250 ml per quart of water) (*stinky*)

rinse _____ a dry / aged print for 5 minutes

tone in tea _____ or other chemical mixture

black tea, 5 tea bags in 1 quart of water

let it steep at least 5 minutes

a new color will be imparted to the Cyanotype emulsion,

a brown-back color rather than the original Prussian Blue

with reddish highlights

immerse the print _____ in the 'bleach'

until the desired amount of color has been removed

the color will shift as well

The same cyclical processing mentioned above can be done here as well. The only difference is which chemical you started with, and that completely changes the color.

ALTERNATE BLEACH and TEA TONE

[reduction then toner]

DEVELOPER > TANNIC ACID . . .

This involves 'bleaching' the print with regular Developer, that removes most or all of the color from the iron, then 'toning' the print with strong tea. This looks scary because the image disappears, but it does come back with a purple/ black color.

mix _____ Print Developer

used straight, mixed according to the instructions in the Darkroom

rinse _____ a dry / aged print for 5 minutes

immerse the print _____ in the Developer

until the desired amount of color has been removed

tone in tea _____ or other form of Tannic Acid

black tea, 5 tea bags in 1 quart of water

let it steep at least 5 minutes

a new color will be imparted to the cyanotype emulsion,

a purple-back color if following a Developer Bleach stage

And continue to experiment!

CYANOTYPE – Alternative Strategies

ALTERNATE CHEMICALS

BLEACHING with SELENIUM

Selenium contains Potassium Ferricyanide that is a bleach. This will produce a more greenish tone in Cyanotypes. Be very careful because Selenium is highly toxic and, like Mercury, and once absorbed into the body it can never be removed.

BLEACHING with OTHER CLEANING PRODUCTS

In the Fall of 2011 Alex Leber took it upon himself to try every household cleaning product in his house. The best results came from Lysol Disinfectant Spray. If you find any other alternative chemicals for toning cyanotypes, please let us know.

TONING with COFFEE

Coffee does not really tone Cyanotype. It does however, tint the paper, and that affects the color of the Cyanotype sitting above it.

ALTERNATE PROCESSES

Below are some suggestions to get different colors, textures and surfaces in your prints.

Speckle Toning

- splash water across the surface of the print
then wait a minute before immersing in water developing bath
- splash Developer across the surface of the print
while toning to make dark speckles
- splash Bleach across the surface of the print
to make yellow dots

Dip Toning

- immerse only part of the print into the toner
- or use a brush to apply toners and bleaches to specific parts of the print
- or even to apply toner to the image area only, leaving the paper border untoned

Apply Water Color paint, or even light Acrylic paint,
so the color blends into the surface of the print.

Sand or scratch the surface of the paper while processing.

The wet surface of the paper is prone to 'distress'. This can be exploited.

Use 'unapproved' papers.

- Some have chemicals that will resist the cyanotype.

- Some produce nice effect, such as Strathmore Bristol Board Vellum,
while others just look washed out.

- Make sure the paper is strong enough to hold up to long washing!

- Rice papers, for example, must be handled very carefully.

Experiment with other types of applicators when coating the paper.

- Any kind of brush can be used from foam brushes to toothbrushes.

- Try a sponge or a rag. Use your imagination.

- Just make sure there is a relationship between the brush stroke and the image.

- Remember – "Form Supports Content".

Experiment with different types of receivers other than paper.

- Cotton cloth is the next most common receiver, followed by
cotton duck canvas for painting (unprimed).

- Any material that has chemicals in it will degrade the quality of the cyanotype, so be
careful. But sometimes funkiness is cool.

CYANOTYPE TONING – resources

RESOURCES:

This information is garnered from several sources:

Photo-Imaging: A Complete Guide to Alternative Processes

by Jill Enfield
Amphoto Books (October 2002)
ISBN: 0817453997

The Book of Alternative Photographic Processes

by Christopher James
Publisher: Thomson Delmar Learning; 1st Edition (June 2001)
ISBN: 0766820777

The Photographer's Toning Book: The Definitive Guide

by Tim Rudman
Amphoto Books (April 2003)
ISBN: 0817454659

and lots of studio experiments...

VENDORS:

Raw Chemicals and Chemical Kits:

Bostick & Sullivan <http://www.bostick-sullivan.com>

Photographer's Formulary <http://stores.photoformulary.com>

note: any of the pure chemicals mentioned above can be purchased as bulk chemistry from Photographer's Formulary.

MSDS Information:

B&S 'Modern' Cyanotype

Ammonium Ferric Oxalate

Potassium Fericyanide

combined makes ammonium ferricyanide

Photo Formulary 'New' Cyanotype

Ferric Ammonium Oxalate

Potassium Fericyanide

Ammonium Dichromate (contrast agent)

Citric Acid

B&S Cyanotype Toner Kit

Solution A = bleach, Sodium Carbonate

Solution B = toner, Tannic Acid