

A couple general FYI's about purchasing vivianite:

Most pigment vendors do not know vivianite changes color. But, if you find one that claims to have stable vivianite, please remember that there is nothing that can be done to prevent it from turning black eventually; it is simply part of vivianite's natural process.

I know many vendors say vivianite is rare; it is not. Most vendors get their vivianite from just a couple veins, primarily in Russia, without realizing it is quite abundant and can be found in vast quantities many places on Earth.

Also: there are more than 500 articles, pdfs, books and documents about pigments and color available in the Library at [Pigments Revealed](#).

You can also find more information about [Pigments Revealed Symposium 2021](#) at Pigments Revealed.

From Brooke H to Everyone: 10:05 AM

Any book recommendations?

I have over 500 articles, pdfs, books and other documents about pigments and color available in the library on my website [Pigments Revealed](#).

From Marjorie Goodwin to Everyone: 10:05 AM

Can you talk about green and how it is created?

You can get green from: chromium cadmium, cobalt, celadonite, copper. Of these celadonite and malachite (copper oxide) are the only ones that will produce green in nature. Chromium naturally produces a rare mineral called eskolaite, but most chrome pigments are altered as are cadmium and cobalt, neither of which produce color naturally, and are altered chemically and physically to produce color.

From Kate Ellis to Everyone: 10:05 AM

Are most pigments from minerals?

Today most pigments are synthetic, i.e., man-made. However, over the past 10 years there has been a growing industry in mineral pigments and there are now several natural pigment vendors around the world.

In the past all pigments came from minerals, vegetation or animals.

From Patricia Larenas to Everyone: 10:06 AM

is Melonie working with native groups to transfer this knowledge?

I am not currently working with any groups. Part of the problem right now is I am the first, and only, person to ever delve into this subject; because of that there are only a few people in the world who can speak to my credibility. Also, getting information out there by myself is tremendous work and costly. I do not have any funding for research or the time spent writing, managing websites and other work involved in this.

Add to that the fact that most people simply don't realize how important this is because color, and the materials that make color have been so thoroughly dematerialized and commodified they are easily ignored or overlooked.

As Natives are working to restore their cultures, they don't even realize something has been lost or is missing; if they don't know something is missing, they're not going to pay much attention to one lone voice. I like to think that someone would have eventually noticed the lack of information about pigments, color and paint technology, but...who knows how long that might have taken.

After a paper I wrote was published in January this year I was contacted by several Native groups about doing workshops and lectures; by March I had 7 workshops and 9 lectures scheduled. If the pandemic hadn't shut everything down, I would have had more. But, while papers in academic journals give me credibility, In my experience word of mouth works better in Indian Country than any other method of advertising.

From Katie Smith to Everyone: 10:06 AM

Do we know if Indigenous cultures manufactured vivianite or if they just collected it?

There is no way to know if Indigenous cultures manufactured vivianite; any evidence of that would not have survived this long, but the simple abundance of it all over the world would make manufacture very unlikely and unnecessary. When you can just take a walk to the local stream and gather it, why bother making it.

From Michelle Gannes to Everyone: 10:06 AM

hello, what kind of classes are you going to be offering

You can see the courses I offer at [Pigments Revealed](#) under Learning Resources. I also do independent study and inquiry-based study that are customized for each student.

From Hannah Hirsekorn to Everyone: 10:06 AM

How long does it take for vivianite to develop on organization material?

That hasn't been nailed down yet. I do know that in 1998 several bodies of Viet Nam soldiers were recovered after 28 years of being MIA and there was vivianite present. That is the fastest natural formation of vivianite documented so far. I've been waiting several years to get my compost to the right stage to begin experimenting with forming it. That may provide some insights into how fast it will form.

From barbara putnam to Everyone: 10:06 AM

Does the time, exposure to O₂ and color at the time of examination reveal the age of an object?

Not as far as I know. How age is determined technologically is through radiocarbon dating, a process by which the amounts of certain isotopes are measured. There's a quick explanation of rc dating [here](#).

Regarding the color: each sample of vivianite changes color at its own rate depending on how much light it's exposed to and other variables. Exposure to O₂ does not seem to affect it. I did simple experiments where I placed fresh, white samples of vivianite in lightfast containers, one of which was filled with water, and vivianite in clear containers, one of which was filled w/water. The samples in the lightfast containers did not change color, however both samples in the clear containers turned blue at the same rate.

The reason I filled 2 of the containers with water was to prevent those sample from being exposed to oxygen. The sample in the clear container with water got the same amount of light

exposure as the sample in the clear container without water, proving is light that causes the color change, not oxygen.

From Matt Campos to Everyone: 10:06 AM

hi. how did that blue pigment stick to the surfaces of their regalia?

It depends on what the material was. On wood vivianite stays quite well with just water. I've seen the interiors of well-used canoes painted with vivianite and water and the paint is still intact.

On leather we typically dampen the leather slightly (I do it with a fine mist sprayer), then rub the pigment into the leather. There is enough collagen, aka hide glue, naturally produced from the damp leather for the pigment to bond very well with it.

From Caroline Nicolay to Everyone: 10:06 AM

Hello! Caroline from England. Thanks Melonie it was wonderful.

Do you know if there is any Vivianite anywhere in Europe or outside the US at all?

Because it forms from very common materials vivianite can be found all over the world. EU is loaded with it, particularly the Netherlands. Vivianite was used by several of the old masters, Rembrandt, Vermeer and de Cuyp, for instance. The earliest documented use of it in EU was in the 1100's.

The best places to look for it are road cuts, stream and riverbanks, anywhere there is erosion or landslides, especially in lowlands, deltas and swampy areas.

From Margarida Vasconcelos to Everyone: 10:06 AM

Do you offer online courses? Thank you

I do. You can see the normal courses I offer at [Pigments Revealed](#) under Learning Resources. I also do independent study and inquiry-based study that are customized for each student.

From Kathy Hattori to Everyone: 10:07 AM

Michel Pastoreau - books on black and blue

Pastoreau actually has quite a few books about color. He is one of the few color historians alive today and has an incredibly rich knowledge-base.

From leslie leonard to Everyone: 10:07 AM

How do you identify the pigments in nature? The one picture showed the pigment inside the Rock

If you're talking about the image with striations of color, the last photo of the sites near where I live, that image is actually a close-up of a cliff, rather than the interior of a rock.

I suggest you go to a local river or stream, or beach, and just collect some colored rocks and earth. The best way to tell if they're going to produce color is to do a streak test; you just scratch them against a any old gray rock and if it leaves a colored streak, it's a keeper! You can also do a streak test on paper.

There are many good geology books with great images of different kinds of minerals, and there are lots of online resources with great images. Also, most places have a local geology guide that can help you find specific minerals near where you live. You can contact local rock-hound groups (I think there's one in pretty much every town in the country!) and they can help you, or contact

your local college or university geology department. Rock collecting is such a popular and common hobby there are many, many resources for learning.

From Monique Sidy to Everyone: 10:07 AM

Can the book list be copied here?

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From Patricia Kessler to Everyone: 10:08 AM

There is no danger in using this pigment?

By the time vivianite has become an earth, or other form, all the organic matter has completely decomposed and become inert. Since it is produced from organic materials and iron, it does not have any toxins, pollutants or heavy metals present.

I do recommend using a face mask when grinding pigments; it's not good to inhale any kind of powdered substance.

From Laurie Matthews to Everyone: 10:08 AM

Thank you! I've worked with vivianite as a pigment and am a landscape historian who has researched cultural landscapes associated with Pacific Northwest Coast Indians, but had never realized the background and deep connection between that pigment and the colors in their art and on their masks.

Laurie, I would love to connect with you and talk! My personal email is copperwomanstudio@gmail.com. Please contact me.

From Jacoline Mulhall to Everyone: 10:09 AM

I have read that indigo has also been seen as a protective color too

I have read that too. Blue has often been attributed with some kind of spiritual or protective powers by various cultures. I have a belief that early people actually understood that neither the sky nor the seas are really blue, so any blue that generated naturally was probably considered very special.

From Deanna Wilkes-Gibbs to Everyone: 10:10 AM

were these pigments used in pottery and glazes, too?

The Chinese have a long history of gorgeous celadon ware, and red clay is basically clay that has been colored by red iron oxide. Vivianite changes color to black when heated so would not make a very good pot or glaze.

From Barbara Putnam to Everyone: 10:13 AM

Is it present in clay?

Vivianite is most commonly found as a clay, and in this form makes the very best pigment. It's usually very clean, free of debris and so finely textured it takes very little grinding to make a paint quality pigment.