

Katrina Lum Designs, metal clay jewelry, sterling silver

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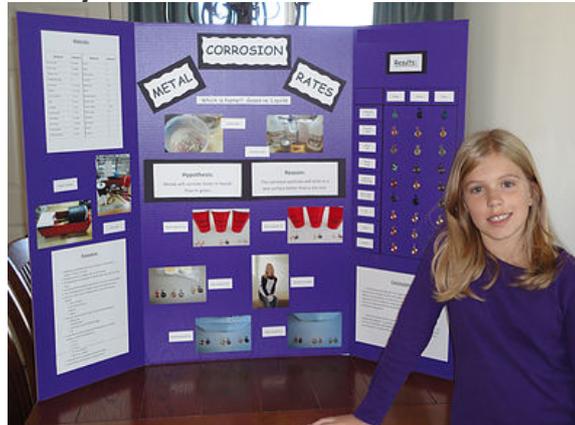
Easy Patinas With Common Household Chemicals

This is more of an informative article than it is a tutorial, but I thought it might be of interest to my fellow jewelry artists. When my daughter participated in her 5th grade science fair, she decided to study the corrosion effects of different gases and liquids on metal. Seeing as I frequently "corrode" a lot of my work, I figured that this might be an excellent tutorial to share. Of course, I don't usually refer to the process as corrosion, instead I call it "patina".....sounds better that way. But no matter what you call it.....the same process is occurring. I personally love putting a patina on my jewelry not only because it adds color, but it also brings out textures and design.

I had a blast doing this project with my daughter. It was an excellent learning experience and a fun opportunity for my daughter to get to try out what mom does on a daily basis. To begin our project, we had to brave the snow and stood out most of the morning (in 15 degree weather) to take some photos and get the project underway. I have to say, I'm a little surprised with a few of the results and am excited to write up the entire project for you all to read.

But before I go any further, I have to make a disclaimer:

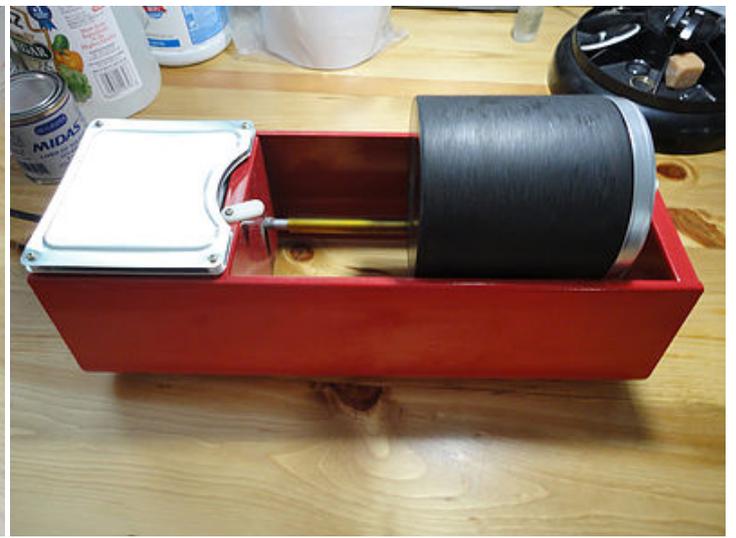
When attempting these tests at home, please be sure to utilize proper safety equipment and only work in a well ventilated area. I suggest using some sort of disposable gloves, an apron to protect your clothing, and safety glasses. Tweezers or tongs are also a great tool to keep your fingers out of chemicals. The Liver of Sulfur is extremely bad smelling (think very strong rotten eggs) and you will not want to have that smell on your hands come dinner time....trust me.



She began with three different metals (copper, bronze, and brass), each being immersed inside 4 different liquids (Liver of Sulfur, ammonia, chlorine bleach, and water) and in 4 different gases (sulfur gas, ammonia gas, chlorine bleach gas, and outdoor air).



Here you can see the three metals in their raw state (from left to right: brass, bronze, and copper).



Each piece was given a bath in vinegar to clean away any preexisting tarnish, oils, etc. Then they were tossed into a rotary tumbler with a few drops of Dawn dish detergent, water, and mixed stainless steel shot for a good polishing.



Next, each of the "pendants" were placed into their testing containers and labeled. The liquid tests were done inside disposable plastic cups. For most of the items being placed in a gas, we poured each chemical in a medium sized Tupperware and turned three small stainless containers upside down inside the fluid to create platforms for each piece of metal. These platforms allowed the pendants to stay and out of the chemical liquid. The entire container was then sealed tight with a lid.



The sulfur gas was produced from a boiled egg inside of a ziploc bag.

The clock began and results were taken at 1, 6, 24, 72, and 168 hrs. Results were recorded by denoting an "L" (for liquid) or a "G" (for gas) at each time interval depending on which corrosive agent produced the greatest color change in each of the metals. They were then tallied to see whether liquids or gases were more corrosive overall. What an unusual bunch of colors she ended up with!!!



Not surprisingly, she got quite a bit of color change from the Liver of Sulfur after one hour. (For those of you not familiar with jewelry design, Liver of Sulfur is a patina-creating product that is made of mixture of potassium sulfides. It's fairly quick acting.)

Because this experiment started tracking results after an hour, the pictures don't show some of the colors that can be achieved with Liver of Sulfur. LOS is a quickly acting patina that comes in the form of small rocks that you need to add to water, or as a gel. To slow the process of color change, use your LOS in cold water. Have a spare glass of water mixed with baking soda to dip your item in to stop further patination when you reach the color you like. To achieve iridescent colors, add ammonia to the LOS solution (the following pictures do not have ammonia added to the solution).

She also saw a really nice change in bronze with chlorine bleach. It produced a nice dark brown patina that would work well for vintage pieces. The two other liquid tests (water and ammonia) did not have any change after 1 hr.



The gas tests were only slightly less effective in the first hour. In fact, with the boiled egg in a Ziploc, you can she got quite a bit of change just in the first 30 min. For those of you wanting to try to patina metals, this is a perfect method to achieve a rainbow of colors on all three metals very inexpensively. Liver of Sulfur will produce the same effects, but in a much shorter period of time.



After one hour, you can see the colors are really coming out. She started with a freshly boiled egg, so you can see some steam in the Ziploc. Copper will start to show a blued steel color very similar to gunmetal.



Results also showed up pretty quickly with ammonia gas . The last two tests in outdoor air and bleach gas had no change at the end of one hour.

By the 6 hour interval, the metals placed in gases were corroding faster and it looked like they might win the race in the end.



The boiled egg had effectively changed all three metals causing an antiqued look to both bronze and brass, while turning copper to a deep gunmetal patina.



The bright blue patinas were already quite apparent on both the copper and brass pendants in the ammonia gas. The bronze had already begun to turn black.



The bleach fumes had even started to corrode all three metals. Copper became a little richer brown, while brass and bronze started to get a duller look to their finish. (No change occurred to the pendants in outdoor air).



Liquids after the 6hr. interval had the following results. Liver of Sulfur turned the copper a dark blue, the bronze a deep blue-black, and the brass had a nice antiqued finish.



The bleach made the largest change on bronze, producing a deep color. Ammonia and Saltwater had not yet begun to make a change.

At both 24 hours and at 3 days, most of the corrosion levels remained the same. The pendants in ammonia gas became more uniformly blue. The liver of sulfur pendants became blacker, and the pendants in bleach liquid and bleach fumes began to slowly show change.

Finally, the experiment ended at 168 hours (or 7 days). If you have the patience to wait this long, the color results in some of the tests are quite unusual and would make for some really neat jewelry. All of the metals showed no significant change in either the water or air tests.



Brass turns to a deep brown-black color in bleach liquid. But in bleach gas, it turns lighter brown and develops turquoise speckles all over it.



It has a golden hue when exposed to a boiled egg. And looks quite similar when left in Liver of Sulfur. In ammonia gas, brass turned a beautiful deep blue, but in liquid form the metal piece only lost a little shine.



Bronze also turned a nice deep brown in liquid chlorine bleach. And turned a cool green speckled color in bleach fumes.



Bronze antiques quite well with a boiled egg, but turns solid deep black in Liver of Sulfur (similar to the picture below). Bronze turns black in ammonia gas. I'm curious to do this experiment over again and toss it in to the tumbler to see how much black I can keep while adding a shine! In liquid ammonia, bronze barely changed at all. It only appears to be slightly darker, but not enough so to use in jewelry preparation.



This had to be one of the coolest changes we saw. Copper grows a bright turquoise powder when immersed in bleach. Although this particular sample wouldn't work well in jewelry, I can see where this application might

work when not left to grow so excessively. In the bleach fumes, copper becomes a coffee brown color with light blue speckles.



Copper antiques to a brownish-blue with a boiled egg, and a deep blue-black with Liver of Sulfur. And, in case you would like to look like you have been undersea treasure hunting, ammonia fumes turn copper a pretty but crumbly blue. It's actually a very pretty looking process at a shorter interval of time. Copper also didn't change significantly in liquid ammonia.

After compiling the data, liquids are slightly faster in corroding metal. Upon further research, she learned that metals will actually corrode more quickly when alternated in liquid and then exposed to gases. Which is why steel ships will corrode more along the waterline than they do fully submerged in seawater.

So there you have it.....how to patina metals at home with normal household chemicals. It may require an ounce of patience to get the result you want, but it's much cheaper than pre-made chemicals and some even produce effects you can't purchase from a bottle!