

## **Caring for Pallasites and Iron Meteorites**

Pallasites and iron meteorites require meticulous care and maintenance to keep them in good condition and, most importantly, free of rust. Rusting occurs in the presence of moisture, so the frequency of care required for your prized specimen depends largely on where you live. For example, if you live on the coast, you may have to treat your specimens more often than if you lived in an arid region like Arizona.

Moisture is the main culprit for most rust issues encountered by owners of pallasites and iron meteorites. It can be present in your display case or hidden deep inside your specimens. To keep moisture in display cases at bay, we recommend purchasing a Renewable Mini-Dehumidifier and placing it inside the case. These machines are designed to absorb moisture in small, enclosed areas, like display cases. They can be purchased for about \$20.00 online and will maintain the environment in your display case as dry as possible to protect your collection from rust.

You should expect your iron-bearing individuals and/or slices to require some additional care. Please inspect your pieces at least once a month. Look for any spots that appear discolored: brown or yellow in hue. These spots may not be actual rust, but require attention.

Discoloration can usually be found around the edges of the specimen and/or in tiny fractures on its surface. Use a bright light and a loupe to make searching for small spots easier.

If you find any discolored spots, treat them immediately with CLR (Calcium, Lime, and Rust remover). For smaller spots, we recommend using a Q-Tip dipped in CLR to gently rub the rusted area. Some spots will wipe away very easily, while others will need to be soaked in the solution for a few seconds, then rubbed. For tougher spots, repeat this process as necessary for several minutes until they disappear.

After your specimen is clean and shiny in appearance, rinse it with alcohol -- the alcohol you use should contain the least amount of water possible. 100% pure alcohol is best, though 91% will suffice. To rinse your specimen, we recommend you place your specimen into a plastic container and then pour alcohol over it until its surface has been completely covered with liquid. Use a plastic bristle brush to gently remove all traces of CLR from your specimen. If you used a lot of CLR and are finding it difficult to remove, douse the specimen again for a final rinse. If you only cleaned small areas of your meteorite using a Q-Tip, use Q-Tips dipped in alcohol to remove the CLR.

Now that you've completely cleaned your meteorite of rust, it should be re-oiled to protect it from further contact with moisture. We recommend Automatic Transmission Fluid (ATF), the kind typically used in car transmissions. You can use plastic gloves to avoid contact with the ATF. To re-oil your specimen, lay it in a plastic container filled with ATF for a few seconds, then remove the piece and use a clean, soft white rag to remove the excess. Take note that iron meteorites with etched surfaces will scratch very easily if rubbed with something sharp or abrasive. Following this treatment, the piece will be ready to go back on display. Depending on how often you find rust spots on

your specimen, you can allow the piece to be submerged in ATF overnight about every 1-2 months.

If you have a specimen rusts noticeably worse or more often than others in your collection, place the piece on a tray and put it in the oven to drive out any moisture that may be trapped in the meteorite's cracks or inclusions. Iron meteorites can be left in an oven at 200° F for one hour. A lower temperature of 150° F should be used for pallasites. Be cautious when handling your meteorite after it has been in the oven: it will be very hot! After removing it from the oven, while the specimen is still hot, let it sit in ATF or a high-quality, light oil. Once the specimen is cool, remove the excess ATF and return your piece to its display case.

When handling iron meteorite or pallasite slices, avoid touching any metal with your bare hands, as the oils from your skin will transfer onto the metallic surface. Always handle a slice by its edges.

Iron meteorite individual specimens may begin to show signs of rusting. If the piece has been cleaned and is dark grey or black in appearance, follow the basic procedure outlined above to treat rusting. If your iron meteorite has a persistent rusting problem, place it in the oven to extract any moisture trapped inside. Generally, iron meteorites can be left in an oven at 200° F for one hour per pound of meteorite. In other words, the larger the iron, the more time it should spend in the oven. Again, exercise caution when handling your meteorite after its been in the oven, as it will be very hot. Wrapping a meteorite in paper towels will help keep it dry as it cools off.

Once your iron is cool enough to handle, submerge it in ATF overnight. A smooth, round specimen can then be wiped off and returned to its display case. A piece exhibiting thumbprints and lots of character requires more detailed attention; let the specimen sit on a stack of paper towels, and wipe it down every so often for a day or two, until it stops dripping and loses its wet, shiny look. Once it no longer looks shiny or wet, it may be returned to its display case.

Irons that feature a natural patina do not typically have rusting issues. Most minor rust spots can be dealt with by using a dry soft bristle brush on the area.

End cuts of irons with natural patina should not be treated with ATF, as the ATF will change the patina in an undesirable way. When ATF is used on these meteorites, the natural patina is completely lost and the piece will appear wet. Dawn dish soap and distilled water can be used to remove the ATF and restore the meteorite's patina. Be sure to use a generous amount of dish soap and a toothbrush to reach the meteorite's smallest nooks and crannies. After cleaning, the piece should be placed in the oven according to the procedure outlined above. Once dry and cool, re-oil the meteorite's metal face by dipping a paper towel into a small amount of ATF and apply it gently to the area. Line a tray with a double layer of paper towels dampened with ATF -- dampened, but not dripping -- and lay the etched face on the paper towels, taking care to avoid any contact between the meteorite's natural patina and the ATF. Let the piece sit overnight, then wipe off the excess before returning it to its display.

We appreciate your purchase with us, and are here to assist you in keeping your collection as pristine as it looks when it arrived.