

# Treating Matrix Opal

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On the opal fields of South Australia a considerable amount of precious opal is found embedded in a kaolinitic clay matrix. This material varies in color from white to light brown or beige and has varying degrees of hardness and porosity. It often has a strong play of color but, because of the clay particles present, it is of very little use as a gemstone in its natural state.

The reason for the dull appearance of the play of color from the opal is due to the fact that part of the light striking the surface of the material is reflected back from the light-colored clay particles and this dilutes the spectrum colors dispersed by the precious opal. See *Figure 1*.

In much of this type material it is possible to dye the clay particles black, which results in part of the light striking the surface being absorbed and the balance being dispersed back by the precious opal and standing out in strong contrast against the black background. See *Figure 2*.

Very pleasing gemstones can be cut from the treated or dyed opal matrix, but because the treatment penetrates only a millimeter or so, it is necessary to cut the stones before treatment.

## Method of Treatment

Several methods, some quite complicated, have been used to treat this type of opal. I have used the method outlined below for several years with excellent results.

Select material which appears to be reasonably porous. Do not attempt to treat the hard, glassy-appearing material, as it will not absorb the treatment.

When the material has been selected, cut a cabochon to the desired size and shape and complete the stone through the pre-polish stage, but do not give it the final polish.

Place the stone or stones to be treated in a sugar syrup. Several types of sugar syrup have been suggested by different people, but I find that a

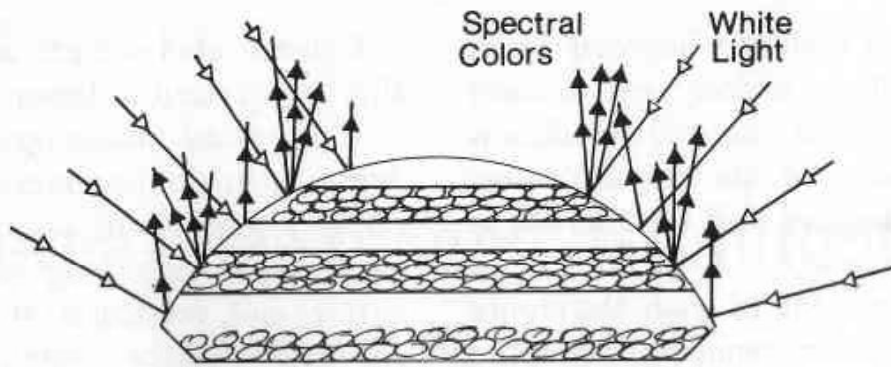


Figure 1. Cross section of untreated matrix opal.

solution consisting of 375 grams of ordinary granulated table sugar to one liter of water works very well. The sugar should be dissolved in the water and the solution brought to a light boil, then removed from the heat and allowed to cool, or the stones can be placed in the solution while it is still hot. Another very satisfactory solution is the white corn syrup available in any grocery store.

Leave the stones in the sugar solution for approximately two weeks, then remove them from the sugar and do not wash them. However, if corn syrup is used the surplus syrup should be wiped off with a paper towel, but

do not attempt to wipe the stones dry.

The next step is to place the stones in a glass container—the writer uses a small pyrex dish about 4 inches in diameter with a cover—and pour into the dish enough concentrated sulfuric acid to cover the stones. Put the dish aside in a safe place for at least 24 hours—any longer period will do no harm.

After the stones have been in the acid at least 24 hours, remove them and wash thoroughly with water. When the stones are removed from the acid, they will be covered with a black film. This is oxidized sugar and can easily be brushed off with a small stiff

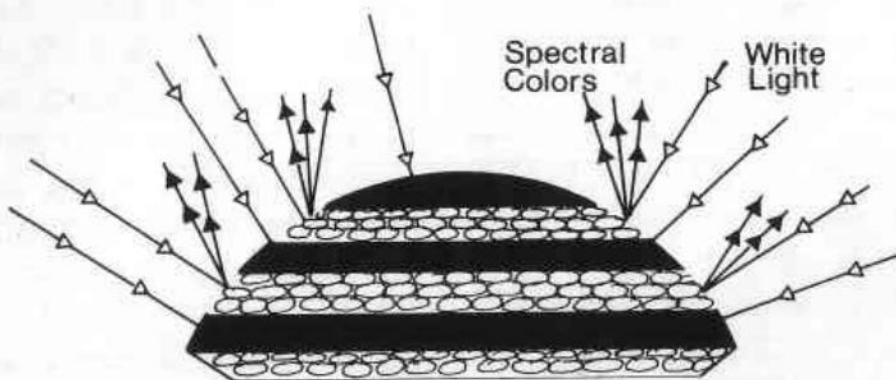


Figure 2. Cross section of treated matrix opal cabochon.

bristle brush such as a fingernail brush or the small brass ones used to clean pans. The matrix material should now be well blackened, allowing the colors from the precious opal to stand out in brilliant contrast.

It is important to wash the stones thoroughly after removing from the acid, and it is a good idea to place them in a strong solution of sodium bicarbonate (baking soda) for about two hours, then to wash them in clean water for approximately 24 hours. The purpose of this is to remove all trace of acid from the material.

The best method I have found for removing the stones from the acid is the plastic print tongs sold in all photographic supply stores.

After the stones are thoroughly washed, they should be given a final polish on a felt or leather lap using tin or cerium oxide or Linde "A".

If the stone has not changed color or has changed only slightly, it is most likely due to the fact that the matrix material is not porous enough to absorb the sugar. However, if the stone has darkened but not enough to provide a strong contrast, it should be retreated following the above procedure.

Concentrated sulfuric acid can usually be obtained at larger drug stores.

If a treated matrix opal is chipped during setting or becomes scratched or chipped while being worn, it can be repaired by removing it from its setting and regrinding it. Since the penetration of the treatment into the surface varies with the porosity of the material, regrinding may result in a drastic change in the appearance of the stone. If this happens, the stone can usually be brought back to its original color by retreating it following the instructions above.

**CAUTION:** Special care should be used in handling concentrated sulfuric acid. Rubber gloves should be worn, and it should be kept in mind that **WATER MUST NEVER BE Poured INTO SULFURIC ACID**. Because of the heat generated, a violent reaction is likely to occur which can splatter the acid dangerously.

As an added precaution, it is well to have a container of water to which baking soda has been added immediately available to counteract the acid in case any should be spilled.

Good luck.