# SPECIES SPECIFIC CLEANING TIPS

- ***Aurichalcite*** and ***velvet malachite*** are O.K. in an ultrasonic cleaner for a short perior of time. (19)

- ***Carbonates*** can frequently be cleaned using full strength bleach. Sodium dithionate can be used to remove rust stains safely from many carbonates, but since it is a weak acid, test first.. Ascorbic and citric acids are usually safe cleaning solutions but test first.

- ***Calcite*** can often be dissolved using vinegar with little chance of dissolving other species. **Test first!**

- ***Copper (British Museum Method)***. The following formula attacks the black copper oxides but does not attack the copper or the commonly attached cuprite. The solution consists (by weight) of 1 part sodium hydroxide (soda lye), 3 parts rochelle salts (potassium sodium tartrate) and 20 parts $H_2O$. Soak time may be a few minutes to one hour.

  ***Copper (calcite removal)***. A dilute solution of sulfuric acid, 1 part acid by volume to 4 parts $H_2O$ will effectively remove calcite without seriously affecting the copper.

- ***Denture cleaner*** has been advocated as a cleaner. Your editor has not tried this, nor does he know the chemistry of the cleaners, so you are on your own. Test with a sample first.

- ***Fluorite*** is extremely heat sensitive, so be careful with ultrasonic cleaning.

- ***Gypsum, variety selenite,*** has perfect cleavage on {010} which allows the penetration of water. Use of detergents will result in deposition of a soap films on the cleavage planes leaving a cloudy crystal. These same cleavage planes also make it difficult to completely remove residual acid from the crystals.

- ***Hydrocarbon*** deposits on the surface of specimens are part of the natural paragenesis, and removal does alter the mineral suite. If removal is desired, ethyl alcohol, Thin-X™, benzene, and carbon tetrachloride have all been used with varying degrees of success. Benzene and carbon tetrachloride are both dangerous chemicals.

- ***Phosphates***. Do not use a phosphate-based detergent for cleaning as this may well leave a residue on the specimen. (19)

- ***Pyrite, marcasite, and pyrrhotite*** should be cleaned in $H_2O$ if no other cleaning method will remove the foreign material. Marcasite will deteriorate less over the years if water is not used. An overnight soak in vinegar will brighten these minerals as will a soak in dilte oxalic acid.

- ***Silver*** can be cleaned by electrolysis. Place the specimen in an aluminum container along with a solution containing 1/2 oz $NaHCO_3$ and 1/2 oz NaCl per quart of solution. The solution can be gently heated to speed up the reaction. (Pearl)

- ***Zeolites***. Most zeolites can be safely cleaned in some kind of acid. Strong acids will reduce many of them to a silica gel. The acid reactivity is directly related to the mineral's silica content. The low silica zeolites react much more quickly to acid than the high silica ones do. The very high silica zeolites like mordenite are very resistant to acids. (8)