

is claimed, though I am not aware of any references describing the demonstration.

PRESERVATION OF SPECIMENS OF MARCASITE AND PYRITE

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The instability of pyrite and marcasite is one that all collectors and curators have experienced, and a cure for which is greatly to be desired. A method of arresting the alteration has been described by Bannister,¹ who also listed localities from which these sulfides were particularly unstable.

The oxidation of pyrite and marcasite results in a series of ferrous sulfates of varying degrees of hydration, but they are hygroscopic and will react with whatever moisture there is in the atmosphere, and the chain reactions gradually cause disintegration of the specimens. Washing with water, in an attempt to dissolve out the salts may produce less soluble basic salts; these are also hygroscopic and the result is merely a postponement of the final breakup of the material.

The following new method has been found successful with pyrite and marcasite specimens which did not contain any associated minerals affected by concentrated HCl; and one must be assured of the absence of even microscopic amounts of such impurities. Pyrite and marcasite are not noticeably attacked by HCl.

The pyrite or marcasite specimen is placed in a closely fitting beaker, and just covered with pure, *colorless, concentrated* HCl. The yellow color quickly assumed by the acid will evince the necessity of the treatment. After a good soaking (perhaps 10 or 15 minutes), the specimen is removed and drained, and placed in fresh, colorless concentrated acid. This procedure is continued until there is no discoloration of the acid. One can now be sure that there are no soluble iron salts left in the pyrite or marcasite, as it takes only a trace of these to discolor the acid.

Since no water must be introduced into the mineral, the specimens are drained, and then soaked in ether until all of the acid is removed. Two soakings in ether should leave the specimens perfectly clean and safe from further alteration even without coating them with plastic films.

Nevertheless, specimens of pyrite and marcasite which have suffered even slight alteration may be quite friable, and it is advisable to soak these in a solution of a plastic to hold them together: the solution recommended by Bannister is one containing 7% (by weight) of vinyl acetate in an equal mixture of acetone and toluene.

¹ Bannister, F. A., *Museums Journal*, **33**, 72-75 (1933); and **36**, 465-476 (1937).