

then in water, and dividing the weight in air by the difference between the weight in water and that in air.

Synonyms and chemical composition of each species is given on the line beneath that on which the above characters are indicated; and then

4. *Other physical properties.* As Lustre, Color, Streak, Refraction, Phosphorescence, Magnetism, &c. "Streak" is the color of a mineral where it is scratched. Phosphorescence is observed in the dark in certain minerals when they are placed on a red-hot iron. Magnetism is observable in some compounds of iron, and the assays of others when calcined. To test this quality a small magnet is required.

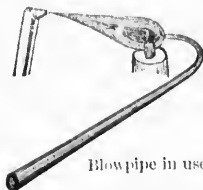
Cleavage is the property which many minerals have of splitting in certain directions. The planes along which they split are called cleavage planes.

Scetile.—A mineral is scetile when it may be cut by a knife without crumbling.

Weathering is the change which takes place by the decomposition of the surface of a rock or mineral from long exposure to the atmosphere and rains.

Malleable.—A mineral is so described when it may be beaten out with a hammer without breaking.

5. *Behaviour before the Blowpipe.* This is one of the most valuable tests and involves the use of certain accessories. Besides the blowpipe itself, which may be of very simple construction, an oil or spirit lamp (not paraffine), charcoal and platinum forceps are required. And a few inches of fine platinum wire is desirable for testing with fluxes, such as borax and soda (carbonate). The end of the wire should be formed into a small ring or loop which is to be filled with the broken or powdered flux, and this melted to a clear bead before the blowpipe. When the mineral is powdered the heated borax-bead will if applied to the powder, pick up as much of it as may be required. Two other fluxes may occasionally be required—sulf of phosphorus, for trying chlorides and fluorides, and silica to use with soda in testing sulphates.



Blowpipe in use.

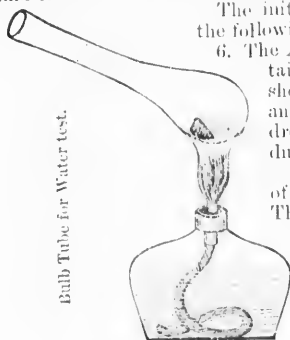
The cone of flame produced by the blowpipe in blowing through the flame of a lamp or candle consists of two parts, the inner cone or *reducing* flame of a blue color, and the outer or *oxidizing* flame of a yellow color. The hottest part of the cone is just at the tip of the blue flame.

To test the presence of water or volatile matter, the mineral should be heated in a glass tube or vial about three or four inches long and as large as a goose quill. The flame should be directed against the outside of the tube beneath the assay, and the water or volatile matter will condense in the upper part of the tube.

The initials "B.B." used in the description of species in the following list signifies "Before the Blowpipe":—

6. *The Action of Acids.* Acids are used to distinguish certain minerals, as carbonates. The acid for testing should be diluted with an equal quantity of water, and the mineral should be coarsely powdered and dropped into it, when bubbles of gas will arise, producing an effect called *effervescence*.

Another effect of the action of acids is the formation of a *jelly*. In this experiment *strong* acid is used. The powdered mineral is dropped into a small quantity of the acid placed in a glass tube and after a while a jelly-like mass is formed. Most minerals of the *Zeolite family* (No. 38-47) undergo this change (gelatinize) in acid. The acids used are nitric, muriatic and sulphuric.



Bulb Tube for Water test.

7. Chapman's Table for determining Minerals—applied to this Catalogue.

ASPECT METALLIC.—Hard enough to scratch glass (common window glass):

Color—Light brass yellow. 12. (See number preceding name of species in the following catalogue or list).

Color—Tin white or silver white. 13.

Color—Steel grey, black, or brown. 19*, 20, a & b & c, 22, 23a.

* Varieties of the same mineral will be found in different parts of the Table.