

Brownish-black when hot, reddish-yellow on cooling, indicates sulphide of arsenic; black while hot, brownish-red when cold, sulphide of antimony; dull black, giving a red powder when taken out and rubbed on paper, sulphide of mercury; lustrous, black, metallic and crystalline when abundant, metallic arsenic; grayish-white mirror-like film, collecting into globules on scratching, mercury.

Borax Bead Tests.—Many substances impart a characteristic color to melted borax, affording a very delicate means for their detection.

The borax bead is formed by making a small loop at the end of a platinum wire, heating it to redness and suddenly dipping into powdered borax, then heating it strongly in the O. F. until a clear glass is formed. If a round bead is not obtained at first, dip again in the borax and heat. Substances are brought into the bead by simply touching it, while still hot, against them, and then fusing the bead again to dissolve the substance. Metals do not dissolve in fluxes, but the oxides do. Substances that contain sulphur or arsenic should be carefully roasted on charcoal, after being pulverized, as these elements interfere with the test. The former element may be detected in this process by the odor of burning sulphur, and the latter by a garlic odor.

The following are the appearances given by the oxides that produce the most characteristic reactions with borax:—

Iron in O. F., brown to yellow while hot, colorless when cold, unless highly saturated, when it is yellow on cooling; in R. F., bottle-green.

Copper in O. F. greenish blue while hot, light-blue on cooling; in R. F., opaque red.

Cobalt, deep blue.

Nickel in O. F., hot, violet; reddish-brown on cooling; in R. F., grey to colorless.

Chromium, green.

Manganese, in O. F., amethyst-red; in R. F., colorless.

The student should practice these tests on substances of known composition until he is very familiar with them before he attempts to work on unknown substances. Considerable practice will be required be-

fore a good reducing effect can be produced. The manganese bead will be the best to work with (using the mineral pyrolusite to produce it,) changing it from one flame to the other after the characteristic appearance is produced.

S. K. HITCHINGS.

[To students who may find difficulty in obtaining the platinum wire mentioned above, I will send pieces of sufficient length—about two and a half inches—for 10 cents each—the actual cost.—Editor SCIENTIST.]

(For the SCIENTIST.)

THE TEACHER AS A STUDENT.

While many of the teachers of our public schools are conscientiously seeking a better preparation for their work, striving to gain greater efficiency each day, constantly looking for better methods, and drawing information from every legitimate source available, many others are content to assume the responsibilities of their position and drag through the monotonous routine of daily work in a mechanical manner, as though it were inert matter, not quickening thought and growing intelligence and plastic character which it is their duty and privilege to direct and nobly impress. The teacher who has ceased to be an earnest student has also ceased to be qualified to lead others into green pastures of knowledge, for by example as well as by precept do we, teach, and with perhaps more lasting influences by the former, and that teacher must ultimately fail of success who, through indolence or carelessness not only neglects thorough preparation for each day's labor in the school-room, but also the building up day by day, from various sources and by multiplied means, of a broad general culture. We know teachers who never subscribe for nor read an educational, literary or scientific periodical;