THE PREPARATION OF PHOSPHORUS, SODIUM AND POTASSIUM FOR LABORATORY USE.

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Where laboratory classes are large and the laboratory time of the pupil is limited, I have found it desirable to have the elements, phosphorus, sodium, and potassium, on the supply shelves already cut in pieces small enough for immediate use.

To prepare this material in the ordinary way by cutting each piece with a knife, however, consumes a great deal of the laboratory assistants' time.

Fig. 1.

A labor and time saving device for the purpose of subdividing these elements into pieces suitable for ordinary laboratory experimentation has been in use in this school for some time; it is so simple and so helpful that I have considered it worth while telling to others.

The general scheme is to melt the substance wanted on a sieve, the mesh of which is the size one wants the pieces of element to be. The sieve is hung in a tall cylinder which is filled with a cold liquid. The liquid should be one with which the element does not react chemically and one whose density is less than that

of the element. The molten globules of the element, passing through the meshes of the sieve, harden in the colder medium below and collect at the bottom of the cylinder as pellets. The accompanying sketch (Fig. 1) will give an idea of the apparatus used.

The can, supported on a ringstand, contains a liquid which vaporizes at a temperature high enough to melt pieces of the element in the sieve at the end of the delivery tube, preferably some of the same liquid with which the cylinder is filled. The can may be heated with a Bunsen burner.

For ordinary phosphorus the cylinder, of course, is filled with water. To keep the oxidation of the phosphorus pellets at a minimum distilled water, from which the air has been expelled by boiling, may be used. Steam generated in the can will soon heat the upper layer of water in the cylinder to the melting point of ordinary phosphorus, which is 44° . Within ten or fifteen minutes enough phosphorous has been prepared in this way to supply a hundred and sixty pupils for a month.

Sodium has a melting point of 95.6° and a specific gravity of 0.9735. Therefore water, even if it did not react with this element chemically, would be a poor medium in which to melt it for the present purpose.

One of the following kerosenes may be used in making sodium or potassium pellets: "Headlight oil" is a water white kerosene with a fire test of 65.5° . The Russian "mineral sperm," "Pyronaphtha," has a fire test of 129.4° . Our own "mineral sperm," sometimes known as "mineral colza oil," has a fire test of 148.8° and a specific gravity of 0.829.

The first of these will be perfectly safe for potassium whose melting point is 62.5° . I have often used it, but with caution, for sodium also.