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Some Useful Devices for the Chemical Laboratory

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SOME USEFUL DEVICES FOR THE CHEMICAL LABORATORY[1]

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The purpose of this paper is to pass on to others the ideas for several devices that have proved their value under regular laboratory use. Although no claim is made for the strict originality of all the basic ideas underlying these devices, their adaptation and development have been at least more or less independent.

A gas evolution tube for use with test paper may be made from 6-mm glass tubing. One end of a two-inch length of tubing is sealed and the other flared with a long taper. Another two-inch length of tubing is drawn to a small jet with taper to match the flare of the first tube, and its other end is given a short flare. The two pieces are then ground to a joint with carborundum powder, the finishing being done with powder of about 400 mesh fineness.

A gas evolution tube for test solutions is made in a similar manner. The first tube is the same but the second is made in two parts and sealed together. The part carrying the taper for the ground joint is drawn out, close to the taper, to a long thin jet which is bent back upon itself. This bent jet is sealed into the other piece, forming a reservoir for a liquid and a bubbling tube for passing a gas through the liquid.

A useful micro-beaker is made from a 6-inch glass or pyrex test tube by flattening the bottom while red hot, against a suitable surface, cutting to proper length with a hot wire, turning a lip, and tooling a spout. An asbestos shingle makes a satisfactory flattening surface, a dry cell carbon sharpened to a pyramid point serves well for turning the lip, and the tang of a small file tools the spout nicely.

An excellent separator for recovering small amounts of oil from large volumes of water has been made by sealing a small tube to an opening blown in the bottom of a test tube, bending to form a U-tube of unequal arms, bending again opposite the middle of the test tube to a slight downward slope when the test tube is vertical, and cutting just beyond the last bend.

For re-distillation of small yields from organic preparations a self-contained distillation apparatus is made from a 10-ml distilling flask and a few pieces of tubing. A 12-inch extension is sealed to the delivery tube of the flask and fitted with a condenser jacket made from 10-mm tubing, after which the end is bent down to form an adapter. If the water outlet of the condenser jacket is made extra long and bent downward, kinks in the rubber hose connected to it are discouraged.

For preventing the escape of fumes from Kjeldahl digestions into a laboratory not equipped with hoods an 8-inch test tube 3/4 full of water supported by its lip in the neck of the Kjeldahl flask has been found very satisfactory. Though possibly not so good as the porous capsules made for the purpose, it is also not so expensive. Another means of disposing of fumes is the ordinary aspirator. For much use with corrosive fumes a glass aspirator is preferable to one of brass, and a serviceable one may be assembled from a T-tube, a glass jet, and a rubber stopper.

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[1] Condensed from a paper presented at the 1940 meeting.

Empty quart motor oil cans have been bound useful for several purposes. They serve as water baths, ice containers, individual trash cans, burner chimneys (with both ends out), and even as pneumatic troughs. Cans of other sizes also find ready uses in the laboratory.

In this connection it seems well to mention the use of ordinary carpet tacks for cleaning deposits of carbon from inside distilling flasks, of a copper wool scouring pad for more accessible deposits, and of pipe-stem cleaners for small tubes. Old razor blades also find uses in removing labels, paint, or other matter from outer surfaces of glass or porcelain.

One other adaptation seems worthy of being passed on. Through the cooperation of the supply house it was found possible to replace the tapered shields of an inexpensive hand centrifuge with round-bottomed brass shields that take ordinary 5-inch test tubes. (The rubber cushions were replaced by thinner ones.) Thus a separation by centrifuge may be made directly in the test tube.

Having described several simple devices that can be made from common materials with moderate skill and little cost, the author hopes that other workers may find them useful.

PETRIFIED WOOD COMPOUND OF OXIDES OF IRON[1]

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Specimens of petrified wood found in the Tertiary Eocene Wilcox sand exposed in bluffs over Red River at Shreveport prove to be composed of oxides of iron (assumed to be hematite and limonite) with no appreciable quantity of organic matter or of silica. Ordinary silicified wood (with occasional specimens partly lignitized) is common in the region, as are small bodies of hematite. Stem and leaf imprints, usually fragmentary, in iron-bearing stones are fairly common. Irregular beds of lignite underlie much of the region.

[1] Abstract of a paper presented at the 1939 meeting and published in condensed form in the Journal of Geology, Vol. XLVIII, No. 2, February--March, 1940, pp. 212, 213.