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DESCRIPTIVE CHEMISTRY

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PART II

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PART II.

(Numbers in parentheses indicate experiments.)

INTRODUCTION.

1. The Bunsen burner is used as the source of heat in most chemical laboratories (Fig. 87). It is attached to the gas cock by a piece of rubber tubing. When the gas is turned on, the current of gas draws air through the holes at the bottom of the tube, and this mixture when lighted burns with an almost colorless, *i. e.* non-luminous, flame. It is a hot flame and deposits no soot. The burner is lighted by turning on the gas full and holding a lighted match in the gas about 5 centimeters (2 inches) above the top of the burner. If the flame is not colorless, or nearly so, turn the ring at the bottom of the burner until the flame is a faint blue. The colorless flame should be used in all experiments unless the directions state otherwise, and should be from 5 to 10 centimeters (2 to 4 inches) high. The hottest part of the flame is near the top.

FIG. 87. — Bunsen burner.

2. Heating. — The following directions should be observed in heating with the Bunsen burner: —

(1) The burner should always be lighted before any piece of apparatus is held over it, or before it is placed beneath a wire gauze which supports a dish or flask.

(2) Glass and porcelain apparatus should not be heated when empty nor over a bare or free flame even if they contain something — unless directions so state. Vessels requiring a support should be placed on a wire gauze which stands on the ring of an iron stand, and heated gradually from beneath. Hot vessels should be heated and cooled gradually; if removed from the gauze while hot, they should be placed on a block of wood or piece of asbestos board — never on a cold surface.

(3) Many experiments require the heating of test tubes. These tubes should be dry on the outside before being heated. The temperature of a test tube containing a solid should be raised gradually by moving it in and out of the flame, or by holding it in the flame and roll-

ing it slightly between the thumb and forefinger. Special care must be taken to distribute the heat evenly. If the test tube contains a liquid, as is usually the case, only that part containing the liquid should be heated; the test tube should also be inclined so that the greatest heat is not directed upon the thin bottom. When the liquid begins to boil, the test tube should be removed from the flame for an instant or held over it. In some experiments test tubes can be held between the thumb and forefinger without discomfort. If they are too hot to handle, a test-tube holder may be used (Fig. 88).

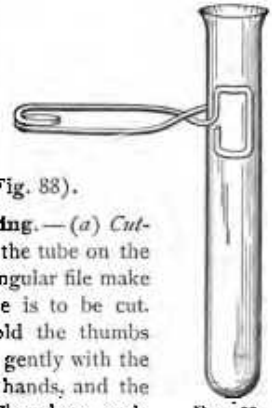

FIG. 88. — Test tube and holder.

3. Cutting and bending Glass Tubing. — (*a*) *Cutting.* Determine the length needed, lay the tube on the desk, and with a forward stroke of a triangular file make a short but deep scratch where the tube is to be cut. Grasp the tube in both hands, and hold the thumbs together behind the scratch. Now push gently with the thumbs, pull at the same time with the hands, and the tube will break at the desired point. The sharp ends should be smoothed by rubbing them with emery paper or by rotating them slowly in the Bunsen flame until a yellow color is distinctly seen or until the ends become red-hot.

FIG. 89. — Wing-top attachment for Bunsen burner.

(*b*) *Bending.* Glass tubes are bent in a flat flame. An ordinary illuminating gas flame may be used, but the Bunsen flame can be flattened by a wing-top attachment (Fig. 89), which slips over the top of the burner tube. The flattened Bunsen flame should be slightly yellow and about 7 centimeters (2.5 inches) wide for ordinary bends. A **right-angle bend** is made as follows: Determine the point at which the tube is to be bent. Grasp the tube in both hands, and hold it so that the part to be bent is directly over the

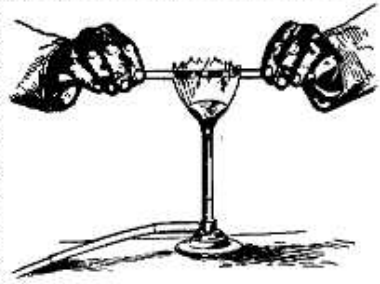

FIG. 90. — Bending a tube into a right angle — 1.