

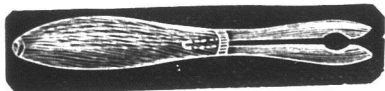
For the Review.]

**PRACTICAL CHEMISTRY.**

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The following apparatus should be obtained as a pre-requisite for the successful prosecution of this study:

- 2 Wide mouth, 6 oz. Quinine prescription bottles of clear glass.  
It is important that the calibre of the neck should get gradually but slightly narrower as it descends, in order that the cork will become tighter as it is driven in farther.—20c.
- 1 Wide mouth, 2 oz. Prescription bottle.—6c.
- 1 Soda or Pop bottle.
- 1 Doz. good corks which will fit the 6 oz. bottles tightly and still leave one fourth of the depth of the cork projecting above the neck of the bottle.—10c.
- 4 Pieces of window glass about 3 in. square. A mechanic will cut them out of a broken pane of glass for you.
- 1 Pair Steel Forceps.—10c.
- 1 Triangular File.—10c.
- 1 Round File.—12c.
- 6 Test Tubes, each 5 in. long.—30c.
- 4 Ignition Tubes, each 7 in. long.—40c.
- 2 Doz. corks to fit the Ignition Tubes.—6c.
- 2 Doz. corks to fit the Test Tubes.—20c.
- 1½ Feet Rubber Tubing, ¾ in. inside diameter.—20c.
- 6 Pieces Soft Glass Tubing, ½ in. outside diameter, each piece about 18 in. long.
- 1 Piece Glass Tubing, ½ in. outside diameter, 18 in. long.—10c.
- 1 Glass Stirring Rod.—5c.
- 1 Large Iron Spoon.
- 1 Small Iron Spoon.
- 1 Yard Copper Wire about the size of broom wire.
- 1 Square Earthen Dish about 5 in. wide.
- 1 Square Earthen Dish about 3 in. wide.
- 1 Square Glass Dish about 5 in. wide.
- 1 Spirit Lamp with suitable wick and glass cap.—25c.
- 4 Reagent Bottles, ¼ pint. One each for sulphuric acid, hydrochloric acid, nitric acid, and ammonium hydrate. Bottles with ground glass labels should be preferred.—60c. to \$1.
- 1 Cork Borer, ½ in.—40c.
- 1 Wooden Test Tube Holder (Fig 1.) This may be made of cedar, or other soft, elastic wood, by the teacher or one of the larger pupils.



- 1 Pneumatic Trough. A rectangular tin vessel 12 in. long, 6 in. wide, 5 in. deep, will answer well. The shelf of the trough should be made of a piece of tin 3 in. wide (with a hole ¾ in. in diameter in the middle) bent so that it will slide upon and be supported by the longer edges of the trough. When the shelf is placed in the trough the hole should be 2 in. below the rim. A tinsmith will make the trough.—40c.
- 1 Wooden Tray, about 24 in. long, 15 in. wide, 3 in. deep, for holding and carrying the apparatus in use.—50c.

**CHEMICALS.**

1 Pint Alcohol (Proof),	55c.
2 Oz. Ammonium Chloride,	5c.
¼ lb. Ammonium Hydrate (Strong),	12c. (in bottle).
2 Oz. Bleaching Powder,	3c.
1 Oz. Bromine,	40c. (in bottle).
2 lbs. Hydrochloric Acid,	30c. (in bottle).
½ Oz. Iodine,	20c. (in bottle).
½ Oz. Litmus (Powder),	10c.
2 Books Litmus Paper,	10c.
Magnesium Ribbon,	25c.
¼ lb. Manganese Dioxide,	5c.
½ lb. Nitric Acid (Chemically Pure),	30c. (in bottle).
1 Oz. Oxalic Acid,	5c.
2 Oz. Phosphorus,	25c. (in bottle).
¼ Oz. Metallic Potassium,	60c. (in bottle).
½ lb. Potassium Chlorate,	20c.
2 Oz. Potassium Hydrate,	15c. (in bottle).
1 Oz. Metallic Sodium,	85c. (in bottle).
2 Oz. Sodium Hydrate,	55c. (in bottle).
2 Oz. Sodium Silicate,	20c.
¼ lb. Sulphur,	5c.
½ lb. Granulated Zinc,	35c.
Metallic Antimony,	10c.
2 lbs. Sulphuric Acid,	40c. (in bottle).
¼ lb. Mercury,	35c. (in bottle).
½ Oz. Aluminum Wire,	
¼ Oz. Silicon.	
1 Small Piece Platinum Foil.	

The prices given will show that both apparatus and chemicals can be bought for about \$11, without including the aluminum, silicon, and platinum. These prices will also serve sometimes in guiding or correcting the judgment of the druggist from whom you are purchasing. The price of the bottle, properly stoppered, is usually included. Small bottles can easily be got, without cost, for the other chemicals. As phosphorus must be kept in water, the bottle containing it should be enclosed in a small tin can, to guard against breakage by frost or otherwise. The bottles containing the sodium and potassium should also be so enclosed.

As several of the chemicals are poisonous, a small, cheap cabinet should be obtained for the whole, which should be kept locked.

The apparatus will last for years, and the quantities of chemicals given will, in most cases, be found sufficient for repeating the course several times. While a course in experimental chemistry at a high school, or at the normal school, would be of advantage, no teacher who has not had such preparation need be afraid of failure. Full directions, with all necessary cautions, will be given for the performance of each experiment.

In order to insure success, the teacher should perform each experiment himself shortly before it is to be done in school. There, one or more of the pupils should be allowed to assist (in turn) in the experi-