

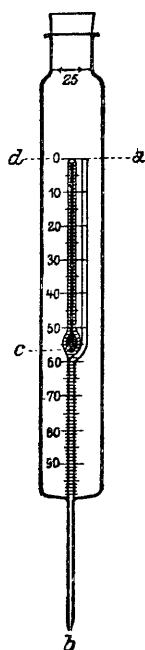
APPARATUS, ETC.

Efficient Boiling-Rod. G. Torossian. (*J. Amer. Chem. Soc.*, 1914, **36**, 513-514.)—Pieces of an alundum crucible or porous porcelain plate are crushed in a mortar to a coarse powder, the pieces being about 0.5 mm. in diameter. The fragments are heated to redness in a crucible, and a piece of glass rod 10 to 12 c.c. long, heated until it softens, is dipped into the alundum particles, which will adhere to the rod. This is repeated two or three times until sufficient particles adhere to

the rod. Another form of rod is prepared by fusing on to the end of a glass rod a small rectangular or triangular piece of alundum, the rod being then bent in such a manner that the fused piece will lie on the bottom of the beaker or flask. The boiling-rod should be placed in the solution when it reaches the boiling-point and not before.

H. F. E. H.

Apparatus for the Approximate Estimation of Free Carbon Dioxide in Mineral Waters. R. Fresenius and L. Grünhut. (*Zeitsch. anal. Chem.*, 1914, **53**, 265-274.)—A simple apparatus for the approximate estimation



of dissolved gases in mineral waters is shown in the figure. This consists of a shaking-tube, 24 cm. long and 30 mm. wide, closed at the bottom, and reduced at the top to a neck, which is closed by a soft rubber stopper. At the bottom of the neck is a mark indicating exactly 125 c.c., and the surface of the rubber stopper must be level with this mark. Inside the wide tube a narrow, open tube, *a-b*, is fused through the lower end. This tube is bent at *c* as shown, and a thermometer is fused on at the bend as a continuation of the axis. The outer tube is graduated with the zero at *a*, situated so that at the level of the opening of the small tube the contents of the larger tube are exactly 100 c.c. The instrument is filled with a sample of the mineral water up to this point; the sample should be taken by immersing the instrument in the water without agitating the latter. The level of the water is allowed to adjust itself through the overflow tube by holding the instrument in a vertical position. The cork is inserted as far as the mark, and the instrument is turned to an inclined position, with the neck downwards. The cork is held in with one hand, and the orifice *b* is closed by a finger of the other. The instrument is shaken vigorously twenty times, so that the pressure of the liberated gas accumulating in the instrument forces a jet of water out of *b* when the finger is removed. This

is repeated until no more water is ejected; the instrument is then returned to the vertical position, and the volume of water displaced is read off. The results for carbon dioxide at *t*° C. and 760 mm. are calculated by the formula :

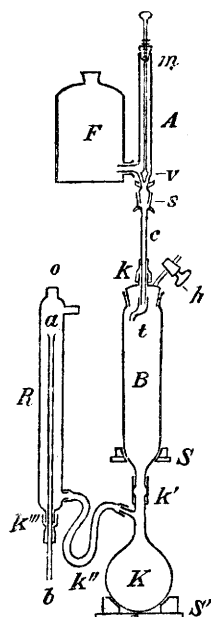
$$\text{CO}_2 \text{ (c.c. per litre)} = 10 C + \frac{C}{V + C} \cdot \frac{1100 a (273 + t)}{273},$$

in which *V* is the volume of air originally contained in the filled instrument (generally 25 c.c.), *C* is the volume of carbon dioxide measured by the water displaced, and *a* is the absorption coefficient per 1 c.c. of water at 0° C. and 760 mm. The value $\frac{1100 a (273 + t)}{273}$ may be calculated for various temperatures in the form of a table.

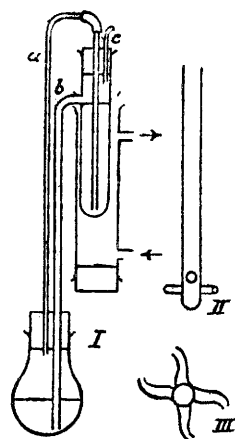
The results when compared with accurate gravimetric estimations show an error within ± 5 per cent.

J. F. B.

Gas Generator for Permanent Use. U. Kreusler. (*Zeitsch. anal. Chem.*, 1914, 53, 234-241.)—The apparatus designed for the generation of gases in the laboratory—*e.g.*, sulphuretted hydrogen, carbon dioxide, hydrogen, etc.—is illustrated in the figure. The charge of acid is contained in the bottle *F*, of about 6 litres capacity, which is connected with the regulating outflow tube *A* by means of a luted joint packed with a mixture of gutta-percha and paraffin wax. The bottom end of the tube *A* is connected by means of the ground-glass joint with a tube *c*, which is so narrow that the acid completely fills it owing to capillarity. The flow of the acid is regulated by the conical glass valve *v*, which is operated from above by means of a glass rod. This rod has a spiral thread of glass fused around its upper portion, where it passes through the split cork *m*, so that the valve may be controlled by a screwing action. The solid substance—*e.g.*, iron sulphide, is placed in the cylindrical glass vessel *B*, which contains about 4 kilos of it. At the bottom of *B* is placed a spirally-wound funnel of stout copper or silver wire, which prevents solid matter from falling through. The cork support *S* is permanently fixed to the wall, but has a slit through which the apparatus can be removed. The flask *K* serves to collect the mud which settles out in the course of use, and the clear liquid flows through the rubber tube *k*, into the overflow and pressure regulator *R*, consisting of a Liebig's condenser with central overflow pipe adjustable in height according to the pressure desired. The small adapter *t* on the end of the acid tube is for preventing the drops of acid always falling in one spot; by rotating the tube *c*, the flow of acid may be distributed in whichever direction it may seem desirable. When in use, the liquid rises in the pressure regulator and drops out as fast as the acid comes in; thus a constant pressure is maintained. The gas is taken off from the cock *h*. J. F. B.

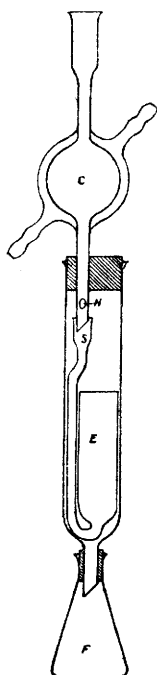


Apparatus for Ether Extraction of Liquids. J. J. L. Zwikker. (*Pharmaceutisch Weekblad*, 1914, 51, 21-23; through *Chem. Zentralbl.*, 1914, I, 1046.)—The illustration is almost self-explanatory. The flask holds the ether, the vapour of which rises through the tube, *a*, and is conducted to the bottom of the liquid to be extracted contained in the test-tube. Fig. II. represents on a larger scale the lower end of the tube, which conveys the ether vapour to the bottom of the liquid; and Fig. III. is a still further enlarged plan view of this arrangement for securing uniform distribution of the bubbles of ether vapour. The ether condenses as it passes up through the liquid, and automatically flows back to the flask through *b*. G. C. J.



New Extraction Apparatus. S. N. Pinkus. (*Biochem. Zeitsch.*, 1914, **60**, 311-313.)—The apparatus, an illustration of which is given in the original, is a modification of the Soxhlet, designed for the extraction of substances at low temperatures, and especially of proteins, when it is desired to avoid coagulation.

E. W.



Extraction Apparatus specially designed for Solvents of High Specific Gravity. C. Budde. (*J. Soc. Chem. Ind.*, 1914, **33**, 184-185.)—When chloroform or carbon tetrachloride are used to extract wax or fat, the solution so obtained has a lower sp. gr. than the original solvent, and thus tends to accumulate in the upper part of the extraction apparatus. This is obviously the reverse of what should happen for efficient extraction, and the solvent in such cases should be supplied from the bottom, and not, as in the ordinary Soxhlet apparatus, from the top. In the apparatus figured (made by Messrs. Brady and Martin, Newcastle-on-Tyne) the vapours of the solvent pass outside the extractor, *E* (kept at the boiling temperature), through the hole *H* in the condenser tube, into the condenser, whence the condensed solvent flows through the side tube *S* into the bottom of the extractor. The solution of wax or fat overflows from the top of the extractor down into the flask *F*. The apparatus may with advantage be used for the extraction of liquids such as aqueous solutions or emulsions, with solvents of lower sp. gr., such as ether. In such cases the side tube *S* must be high enough to allow the ether to force its way through the water into the extractor.

H. F. E. H.

