A NEW FORM OF ALKALIMETER.

By Charles B. Davis.

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THE apparatus (Fig. 1) may be described as follows: A (Fig. 2, I) is the water or acid chamber of about 10 cc. capacity, to the bottom of which is attached a bent capillary tube for the passage of the water or acid to the body of the apparatus. The liquid in this chamber is held in place by virtue of the existing pressure below and partial vacuum above the liquid, there being no stop-cocks to get out of order. B is the drying chamber which is supplied with two bent capillary tubes for the introduction of the gas into the drying material, which is generally concentrated sulphuric acid. Both chambers are supplied with glass stoppers, and are separated by a glass partition. C (Fig. 2, II) is the body of the alkalimeter having a capacity of about 75 cc., which is intended to carry the material to be tested. The convenience of this section of the apparatus is that it may be tared on the balance, and a portion of the sample to be examined weighed directly into the alkalimeter, thus avoiding all loss caused by transferring, as in the average alkalimeter now in use. I and II are connected by an air-tight ground joint.

Fig. 1.

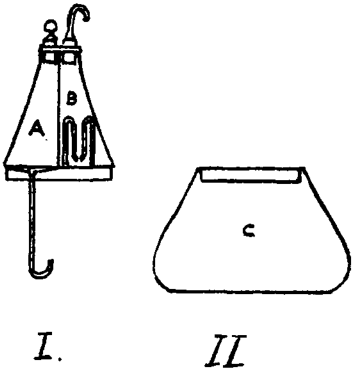

Fig. 2.

The alkalimeter having been thoroughly cleansed and dried, the body of the apparatus is tared, and a portion of the material to be examined, in powdered form (which should contain not more than 0.5 gram of carbonate), is weighed in together with 2 grams of a mixture of equal parts salicylic and benzoic acids.

The mixed acids I have found to give better results for all carbonates, than either alone, although either will answer the purpose in most cases.

The drying chamber is half filled with concentrated sulphuric acid, and to the water chamber is added 10 cc. distilled water freed of the gases it usually contains. Both sections are now brought together and allowed to attain the temperature of the balance.

The alkalimeter thus charged is carefully tared, and by removing both stoppers the water flows into the body of the apparatus, which causes an immediate generation of carbon dioxide; this moisture-laden gas passes through the capillary tubes into the acid of the drying chamber where it is deprived of its moisture and escapes. When this first evolution of gas ceases, the apparatus is carefully shaken, and this is repeated until no further generation of gas results. No heat is employed for the alkaline carbonates, while for the earthy carbonates a temperature as low as 55° will be found to be sufficient.

The alkalimeter is now freed of its remaining carbon dioxide by causing 0.5 liter of dry air, freed from carbon dioxide, to pass through the apparatus.

The following results were obtained with calcium, barium, and magnesium carbonates:

CARBON DIOXIDE.

	Found.	Theory.
Calcium carbonate	43.98	44.00
Barium carbonate	22.38	22.33
Magnesium carbonate	52.40	52.38

This method for estimating carbon dioxide will be found useful in the examination of baking-powders, as well as for the alkaline and earthy carbonates.

THE DETERMINATION OF LITHIA IN LEPIDOLITE.

BY W. J. SCHIEFFELIN AND W. R. LAMAR.

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THE J. Lawrence Smith method for decomposing the silicate is more convenient than that of dissolving in hydrofluoric acid, as the alkalies are separated from the alumina as chlorides in one step, thus avoiding two precipitates, aluminum hydroxide and barium sulphate, which are sure to hold back lithia. A