

into a flask with 100 cc of 1 per cent citric acid solution, stopper tightly and shake violently until the filter paper is reduced to a pulp. Add 100 cc additional of the 1 per cent citric acid solution and digest at room temperature for half an hour, shaking the flasks thoroughly every five minutes. With five analyses in hand this means an agitation of one minute duration repeated six times. Filter and wash thoroughly. Dry and transfer the filter and its contents to a crucible, ignite until all organic matter is destroyed, add from 10 to 15 cc of strong nitric or hydrochloric acid and digest until all phosphate is dissolved. Dilute the solution to 200 cc, mix well, filter through a dry filter and proceed as for the estimation of total phosphoric acid.

(b) In non-acidulated samples—In case a determination of citric insoluble phosphoric acid is required in non-acidulated samples, such as mineral phosphates basic slag, Thomas phosphate powder, ground bone, bone char or bone ash, it is to be made by taking two grammes of the phosphatic material (without previous washing with water) and introducing it into a flask with 100 cc of a 5 per cent solution of ammonium chloride and boiling it for forty minutes, replacing always the evaporated water, then filtering and washing the residue and treating it, exactly as above described with 1 per cent citric acid solution, determining the phosphoric acid in the residue.

*Citric Soluble Phosphoric Acid.*—The sum of the water-soluble and the citric-insoluble phosphoric acid subtracted from the total contained in the fertilizer gives the citric-soluble phosphoric acid.

The sum of the latter and the water-soluble phosphoric acid is to be regarded as 'available phosphoric acid.'

I beg to recommend the publication of this report, together with Tables I and II, as well as the 'Memoranda on Manures,' which it has been customary to print at the same time.

I have the honour to be, sir,

Your obedient servant,

THOMAS MACFARLANE,

*Chief Analyst.*