

acid present. The liquid then assumes a yellow color, and deposits a yellow precipitate of a crystalline structure, the formation of which is accelerated by heating.

This precipitate consists of about three per cent. of phosphoric acid, a very small quantity of ammonia, and, the rest, of molybdic acid, which are united to each other in a manner yet doubtful. It is easily soluble in ammonia; and also in an excess of phosphates; insoluble, however, in hydrochloric and nitric acids.

These conditions demonstrate at once, that the application of this method, is especially adapted to the tracing of small quantities of Phosphoric Acid as in soils. In this case no excess of phosphates, in which the form precipitate could be dissolved, is to be feared, nor any danger in overlooking a precipitate, which consists almost entirely of substances used for precipitation, with only a small portion of the substance which is the object of search.

Direct experiments to test the sensibility of this re-agent were made, and the following results obtained.

By dissolving 5 grammes of crystallized phosphate of soda, which contain 1 gramme of Phosphoric Acid, in 25 grammes of water, a solution was obtained, which contained in all its parts 1-30 of its weight of Phosphoric Acid.

With this normal liquid, different other solutions were then made, by diluting the former with water and a suitable quantity of nitric acid; the respective quantities of Phosphoric Acid in which were 1-300, 1-3000, 1-6000, 1-12000, 1-24000, 1-48000, 1-96000, 1-192000.

After molybdate of ammonia being added, and the whole heated, 1-48000 or 1-50000 of the dilutions created a distinctly visible precipitate. The 1-96000 dilution formed after a few days a little precipitate which did not appear at the 1-92000 dilution.

Experiments performed in the same mode, differing only with regard to the normal liquid, which was in this instance diluted with a concentrated solution of a soil, in nitric acid, (the soil did not contain any appreciable quantity of Phosphoric Acid) instead of acidulated water, led exactly to the same results, viz: 1-48000 or 1-50000 dilution caused immediately a distinct precipitate; 1-96000 after a few days; 1-192000 none at all.

Organic matter, iron clay, lime, and all those substances, which are extracted by the aid of nitric acid from soils, had exercised not the least influence on this reaction.

After these remarks, the last but most important point to be considered is finally the manner in which the above mentioned results of observations can be applied for the recognition and the quantitative determination of Phosphoric Acid in soils, as distinctly as the farmer needs knowing it.

The solution of this point leaves now hardly any difficulties.