Thus, other methods of separating and determining the potassium extracted by these solutions have been investigated. This report describes a rapid method that also greatly reduces the amount of readsorption of potassium.

The proposed method is based on the fact that the tetraphenylboron ion is not stable in boiling aqueous solutions. This can be seen from the data in table 1. These results were obtained in an experiment in which 5 mg. of K (KCl) was added to 15 ml. of 1N NaOAc (pH 5) and 3 me. of NaBPh₄. In some cases the NaOAc-NaBPh₄ solution was boiled for 20 minutes before the KCl was added; in others, it was boiled for the same length of time after the KBPh₄ was formed. Also, for comparison, some of the systems were held at 25° C. and not boiled. All of the systems were then filtered and the potassium in the filtrate was determined by flame photometry.

It is evident from the data in table 1 that practically all the potassium in the aqueous systems containing NaBPh₄ or KBPh₄ was in solution after the systems were boiled. Thus, potassium that has been extracted from micaceous minerals and precipitated as KBPh₄ should be separable from NaBPh₄-salt-mineral mixtures by simply filtering the boiled system. The extracted potassium in the aqueous filtrate could then be readily determined by flame photometry.

Many factors determine the length of time that the NaBPh₄-salt-mineral mixture must be boiled to be sure that all of the potassium is in solution. Diluting the system with water before it is boiled is particularly helpful in reducing the boiling time. In any event, the system must be boiled until the KBPh₄ precipitate disappears and no precipitate appears when the filtrate is cooled. Also, to prevent the readsorption of potassium by the degraded mineral, the mineral should be ammonium-saturated before the system is boiled. The degraded mineral will fix ammonium ions just as it does potassium, thus the ammonium will block the adsorption of potassium that is brought into solution by boiling. Most of the excess NaBPh₄ should be removed before the ammonium is added, however, because NH₄BPh₄ is also insoluble in aqueous systems.

The following procedure is, therefore, proposed. Filter the NaBPh₄-salt-mineral mixture to remove the excess NaBPh₄, transfer the filter paper and the residue to a large volume of 0.5N NH₄Cl, boil until the KBPh₄ precipitate disappears, cool, filter and determine the potassium in the filtrate by flame photometry. This method has been used with known amounts of KCl in water and with NaBPh₄-salt-mineral mixtures.

In triplicate experiments with water solutions containing 12 mg. of K (KCl), 1 me. of NaBPh₄ and 15 ml. of 1N NaCl, 99.8% of the added potassium was recovered.

The mean results obtained with duplicate potassium extraction experiments with biotite are given in table 2. In these experiments, 0.5-g. samples of biotite that had a particle size of 250 to 1000 μ (by sieving) were mixed with 15 ml. of 1N NaCl and 1 me. of KH₂PO₄ at 25° C. At the end of this extraction period, in one-third of the systems was separated from the biotite by washing the mineral on a 300-mesh (50 μ) screen with 12 mg. of K (KCl), 1 me. of NaBPh₄, and the extractate were then filtered and the potassium in the filtrate was determined by flame photometry.

The extracted potassium values obtained by separating the KBPh₄ by washing should be a good estimate of that present in the biotite if the potassium was removed by the proposed boiling method. Results from experiments in which the potassium was removed by the proposed boiling method and subsequently was replaced during the 72-hour extraction period, it is evident that all the potassium removed by the proposed boiling method was done in NH₄Cl. When the biotite was boiled with water, much of the potassium was readsorbed by the mineral.—A. D. SCOTT and M. G. REED, Research Associate, respectively, Department of Agronomy, Iowa State University, Ames.

PHOSPHORUS AND BICARBONATE EFFECTS ON SR⁸⁵ ACCUMULATION

The accumulation of radioactive strontium by plants is of considerable interest because of fallout from nuclear weapons testing. Although this subject has received considerable attention, with effects of phosphorus, carbonate, organic matter, plants having been studied, little is known about effects on strontium accumulation. In the present work, the importance in strontium accumulation on a different subject have been made in this laboratory. Effects on strontium accumulation and translocation have been studied with effects of calcium, potassium, bicarbonate, and organic acids in plant roots. Effects on strontium accumulation and translocation have been studied with effects of calcium, potassium, bicarbonate, and organic acids in plant roots.

As an example of the results obtained, one of the experiments is detailed in table 1. A biotite that had germinated in sand with tap water, emergence two of the seedlings were transplanted into soil. The loss of 12 mg. of K (KCl), 1 me. of NaBPh₄, and the extraction of added KCl was recovered.

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