GRAVIMETRIC MICROANALYSIS OF BERYLLIUM SILICATE ROCKS.

THE SEPARATION AND QUANTITATIVE DETERMINATION OF SILICIC ACID, PHOSPHORIC ACID, ALUMINIUM, IRON, BERYLLIUM, MAGNESIUM AND CALCIUM IN A SINGLE SMALL SAMPLE AND THE MICROANALYSIS OF THE MINERAL "KOLBECKIT".

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Introduction.

The largest part of the work reported in this paper was carried out by Dr. THURNWALD during my absence in the summer of 1931. It is therefore not more than just that Dr. THURNWALD be credited with having brought to a successful conclusion a very difficult task requiring continuous and careful attention. The surprising accuracy of the results must also be attributed to the more than ordinary skill acquired by her in the course of the lengthy investigation. It is also due to the fact that Dr. THURNWALD was able to devote her time exclusively to this kind of work.

It was found impossible to mention in the following all of the various preliminary experiments necessary to ascertain the proper procedure and conditions. Also the reasons why the original scheme proposed for the separation of the silicic acid was altered, may be seen from the literature on rock analysis and need no further explanation.

For the sake of brevity we are therefore forced to report merely the final successful experiments, referring as far as possible to
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previous publications\(^1\) which give more detailed information as to the individual separations and determinations used in the present work.

I would like to point out, that this paper gives for the first time a well founded procedure\(^2\) for a very complicated quantitative separation which can be started with only a few milligrams of sample. Every single step (separation or determination) has been tested separately and in combination with all of the previous operations which might influence it, so that practically nothing was left to chance or to assumption. Finally the procedure is shown in its application to the analysis of an actual silicate rock.

Accordingly the following description is divided into the paragraphs:

A. Separation and determination of beryllium and aluminium.
   a) The determination of beryllium as anhydrous sulfate without previous precipitation as hydroxide.
   b) The determination of beryllium as anhydrous sulfate after previous precipitation as hydroxide.
   c) The separation and determination of aluminium and beryllium.

B. Separation and determination of beryllium and magnesium.
C. Separation and determination of aluminium and magnesium.
D. Separation and determination of aluminium, beryllium and magnesium.

E. Separation and determination of phosphoric acid, aluminium, beryllium and magnesium.

F. Separation and determination of silicic acid, phosphoric acid, aluminium, beryllium and magnesium.

G. Analysis of a microsample of the mineral "Kolbeckit".
   a) Qualitative analysis.


\(^2\) I have already carried out complicated quantitative micro separations years ago. See F. Emich, Lehrbuch der Mikrochemie (München 1926), p. 158. But the methods used at that time were by far not so carefully tested, as the analyses were carried out on occasional request.