

NOTE ON THE IRON CONTENT OF MICROCLINE

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The minimum Fe-content found by spectrographic analysis in a number of microcline samples from granite pegmatite is of the order of 20-30 ppm. It is probable that the true Fe-contents of such microclines are even lower than this.

Chemical analyses of carefully selected microcline samples usually show Fe-contents in the range 500 to 2,000 ppm and Mg-contents in the range 200 to 500 ppm, in some cases also Mn-contents in excess of 100 ppm. Small parts of the Fe and Mn are believed to be possible true constituents of the feldspar, but otherwise the presence of these elements is ascribed to impurities, e.g. biotite. The very small samples required for optical spectral analysis can be checked much more effectively for purity. Such samples from a considerable number of large granite pegmatites in the Precambrian of southern Norway were examined by a semi-quantitative procedure. Lines of Fe, Mg, and Mn are present in every one of the spectrograms. The estimated contents are within the following ranges: Fe 20-400 ppm, Mg 15-60 ppm, Mn 5-25 ppm. These figures are roughly one order of magnitude lower than those obtained by ordinary chemical analysis. Thus the general impression is that the impurities have still not been completely removed from the samples; they may be present as microscopic or sub-microscopic inclusions. Two or more samples taken from the same specimen agree fairly well as to the contents of Fe, Mg, and Mn. But within the whole series of samples the ratio Fe/Mg varies from more than 10 to less than 1. The results do not give any definite answer to the question whether these elements may be true constituents of the examined microclines. If the answer is in the affirmative, the contents must obviously be extremely low, probably lower than the above minimum values. In particular the Fe-contents, which are known to be considerable in certain feldspars, appear to have an upper limit of at most 20 to 30 ppm in microcline from the type of deposit in question. Moreover, this would seem to be in accordance with a result arrived at by I. Th. Rosenqvist (1951), based on laboratory experiments and theoretical considerations that a notable replacement of Al by Fe would require an extremely

high Fe/Al activity ratio during the crystallization of the microcline. It does not seem probable that such conditions have prevailed during the formation of ordinary granite pegmatite.

REFERENCE

ROSENQVIST, IVAN TH., 1951: Investigations in the crystal chemistry of silicates. III. The relation haematite - microcline. *Norsk Geol. Tidsskr.*, 29, 65 - 76.

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