

ON THE RADIUM CONTENT OF SOME NOVA SCOTIAN MINERALS.—
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An attempt was made to develop a more sensitive method for measuring the radium content of minerals and in the process the occasion arose to make some measurements on a few Nova Scotian minerals, the results of which seem worth recording.

METHOD

Only a resume of the method used need be given in this note. The radium emanation was boiled off from a solution of the mineral as usual. Instead of a gold leaf electroscope, the measuring instrument was a quadrant electrometer used ballistically. The emanation was introduced into an ionization chamber having a quartz insulated electrode. This electrode was made to charge up from earth potential, for a known time, by a suitably applied electric field, and then connected to a previously earthed quadrant of the electrometer. The magnitude of the resulting ballistic kick was then observed.

The ballistic method possessed several advantages over the ordinary rate of deflection method. In the first place, the natural leak was considerably decreased. This was very important in the present work, which was done in the summer when the leak over the amber supports of the quadrants was very large. Secondly, all shift of the zero during the charging period was eliminated.

The minerals were obtained in solution by grinding in a mortar and boiling with aqua regia. The solutions thus obtained were sealed up and left for the emanation to accumulate for a period of four or more days.

RESULTS

The apparatus was calibrated with standard carnotite solutions. Blank tests made it possible to correct for natural ionization in the chamber. The sensitivity of the electrometer used was about 450 divisions per volt, while that of the

apparatus as a whole was 58 electrometer scale divisions per 11^{-10} gram of radium per minute of time of charge. Thus by taking 10 grs. of the mineral, a measurement could be made on a specimen containing 10^{-13} gram Ra. per gram. The following results were obtained:—

Specimen	Location in Nova Scotia	Ra. content in grs.: per gram of mineral.
Common salt	Malagash, Cum. Co.	Less than 5×10^{-14}
Potash salt	Malagash, Cum. Co.	Less than 5×10^{-14}
Felspar (light)	Governor's Lake, Hfx. Co.	8.7×10^{-12}
Felspar (dark)	Governor's Lake, Hfx. Co.	14.0×10^{-12}
Siliceous slate	Upper Musquodoboit, Hfx. Co.	2.6×10^{-13}

REMARKS

The dark felspar contained a number of dark coloured impurities of which mica was one. The tests on the Malagash deposit were suggested by Dr. Ellsworth, of the Geological Survey of Canada, as possibly capable of throwing light on the origin of that deposit. The measurements were made on both the soluble and insoluble parts of the salt and no trace of radium was found in either. Further measurements were cut short, owing to the lack of time and to some difficulty in getting samples.

In conclusion, I wish to thank Dr. G. H. Henderson for his kindly interest and guidance throughout the work.