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APOANALCITE, A NEW MINERAL

BY

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With 1 figure.

Abstract. A red zeolite mineral in a syenite pegmatite from Nordmarka, Oslo Region, was found to have optical and chemical properties deviating from the known zeolites. Because of the similarity to analcite, the mineral is called apoanalcite.

In 1925 professor J. Schetelig found an erratic boulder of syenite pegmatite in a gravel pit at Voksen, 5 km NW of Oslo. A hand specimen of it is stored in the Geological Museum in Oslo. A red mineral was specially emphasized on the label. The specimen chiefly consists of grey micro-(crypto-) perthite with some aegirine and biotite crystals, and a massive red mineral, slightly columnar. Such pegmatites are found in various parts of Nordmarka, north of Oslo. Supposing that the red mineral was a zeolite of the natrolite group, I determined the following optical elements:

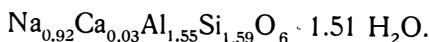
Optically positive, uniaxial, $\varepsilon = 1.487$, $\omega = 1.475$.

These properties agree with the doubtful zeolite laubanite, but they also suggest an analcite with extraordinarily high anomal birefringence.

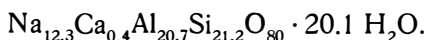
In order to determine the mineral I had a chemical analysis made. Only 0.2 gr was available for the main portion, and the alkali determination was carried out on 0.13 gr. Thus the errors may be four times as large as by a common analysis, and therefore only one decimal is tabulated. The analysis was carried out by mag. scient. Lars Lund, Kjemisk Institutt.

SiO ₂	41.2
Al ₂ O ₃	34.0
Fe ox.	-
MnO	-
MgO	-
CaO	0.7
Na ₂ O	12.2
K ₂ O	tr.
H ₂ O	11.7
	99.8

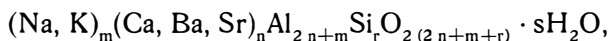
Calculated on 6 O-atoms, the analysis gives the following formula:



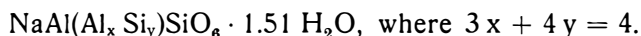
With 80 O-atoms the formula is:



No ordinary zeolite has this composition, and the formula does not agree with the general zeolite formula, as given by Berman (1937. p. 371):

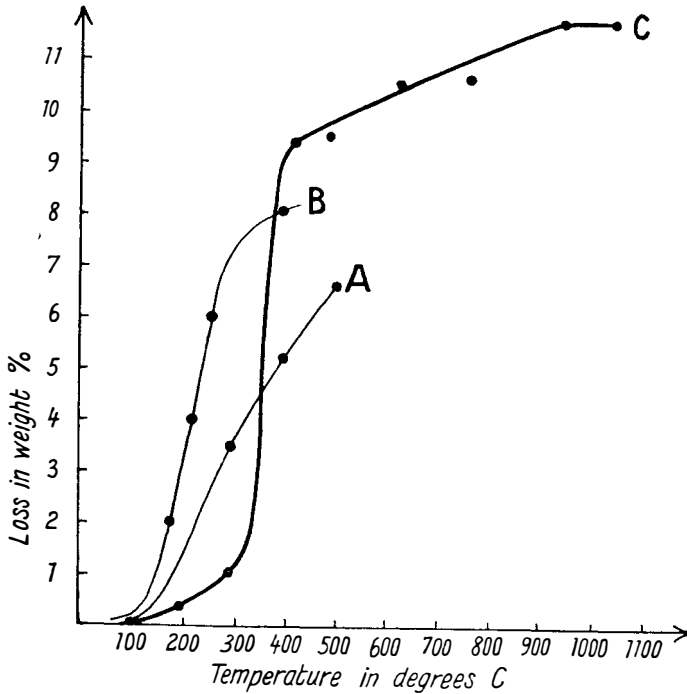


expressing the principle that each Al entering into $x \cdot \text{SiO}_2$ is balanced by one (Na, K) or $1/2$ (Ca, Ba, Sr). In the present mineral Al has substituted Si in excess of the Na and Ca contents. The formula may accordingly be written:



The common analcites sometimes contain H₂O and SiO₂ in excess of the tenor indicated by the formula NaAlSi₂O₆ · H₂O (Winchell, 1933, p. 293), but only to such a limited degree that Berman (1937, p. 374) says: "Analcite is a well established species with a fairly definite composition; only small amounts of Ca and K enter into the composition."

Thus the present mineral deviates from analcrite both in composition and in formula type, and it probably represents a new species. The mineral shows a more close resemblance to analcrite than to any other zeolite, and it is possibly an alteration product of analcrite, therefore the designation *apoanalcite* is proposed.



Dehydration curves of: A. Analcite (Friedel 1896. B. Analcite (Milligan 1937).
C. Apoanalcite.

It might be supposed that the new mineral is made up of two or more minerals. But a thin section shows that the red aggregates form only one mineral. The hypidiomorphic individuals show a pronounced undulatory extinction.

The dehydration of apoanalcite has been determined by mag. scient. Lars Lund:

Temp., degrees C	110	200	200	300	420	490	630	770	950	1050
Hours of heating	2.5	1	24	1	1	3	15	8	18	2
Loss, weight-%	0.00	0.33	0.33	1.01	9.40	9.50	10.50	10.62	11.73	11.73

The dehydration curve shows that more than one H_2O is given off suddenly between 300° and 420° . On the figure two curves are plotted for analcite, one old determination and a recent one. Both of them demonstrate a continuous dehydration.

Analcite from the Oslo Region has been described by Brøgger (1890, pp. 565—585). The mineral is greyish white, in some cases

yellow, thus it cannot be confused with apoanalcite. But natrolite is very common in the syenite pegmatites, and some of the specimens of the massive red natrolite, which has simply been labelled "spreu-stein", may prove to be apoanalcite on further investigation.

Mineralogisk Institutt, Oslo, October 1946.

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