AN OCCURRENCE OF XONOTLITE IN MINNESOTA[1]

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In a recent article on the identity of eakleite and xonotlite Dr. Larsen[2] noted that he had found the mineral in specimens from Mineral Center, Minnesota. While engaged in field work for the Minnesota Geological Survey during the past summer, the writer was shown the test pit from which the material examined by Dr. Larsen was obtained. The occurrence proved to be of such interest that it was examined in some detail.

The material described was obtained from a test pit about 20 feet deep and located in the SW$\frac{1}{4}$ SE$\frac{1}{4}$ Sec. 35, T.64 N., R.5 E., Cook County, Minnesota. This is an area of Animikie graywacke and slate with many Keweenawan intrusives, principally large dikes and sills of diabase, with some of rhyolite porphyry. The pit followed vertical fractures and veins in a diabase dike near the contact with slate. Specks of sulphide may be seen disseminated through the diabase, but in the veins are masses consisting principally of sulphides, these being largest where fractures intersect. Included in the sulphides in the vein are masses of xonotlite and diopside. The best occurrence noted was a mass of these minerals ten or twelve inches across. The mass consisted of several rounded lumps or nodules of xonotlite ($5CaO.5SiO_2.H_2O$), with a border of diopside (see Fig. 1). At places the diopside was altered and rusty, but other masses were fresh. The nodular character might suggest a later origin than that of the other minerals of the vein, but the other conditions indicate strongly that the xonotlite and diopside were deposited at approximately the same time as the other vein minerals. Thus in this occurrence xonotlite is associated with minerals characteristic of depth and high temperature.

Examination of the sulphides on polished surfaces showed the presence of chalcopyrite, pyrrhotite, polydmite, and sphalerite. Only chalcopyrite and pyrrhotite are abundant. They occur as intergrown masses and with pyrrhotite cutting the chalcopyrite in blade like bands. These minerals are apparently contemporaneous. Polydmite occurs as scattered remnants in the chalcopyrite and pyrrhotite, and sphalerite as rare minute particles.

[1] Published by permission of the Director of the Minnesota Geological Survey.

[2] Larsen, E. S., The identity of eakleite and xonotlite: *Am. Min.*, **8**, 181-182, 1923.

The xonotlite has a very pale pink color which is noticeable only on fresh surfaces. Analyses of two different fragments were made by Mr. J. H. McCarty of the Minnesota School of Mines Experiment Station.

ANALYSES OF XONOTLITE FROM MINERAL CENTER, MINNESOTA

	1	2
SiO_2	48.22	47.97
FeO	1.16	1.05
Fe_2O_3	.....	.53
CaO	45.98	44.26
MgO	0 11	0.17
H_2O (comb.)	4.07	3.26
Al_2O_3	35	2.51
CO_2	n.d.	0 10
	99 89	99.90

A thin section of the contact of the xonotlite and diopside showed the relation of the two minerals to each other. The

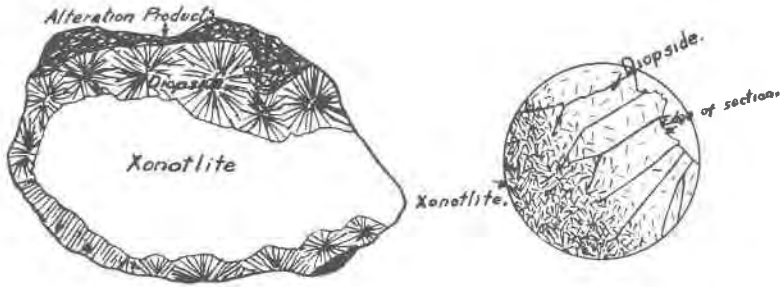

FIG. 1. A nodule consisting of xonotlite with a border of diopside. The sketch represents a section through the center of the nodule. $\frac{2}{3}$ natural size.

FIG. 2. Sketch of the contact of xonotlite and diopside as shown in thin section. Mag. X 20.

xonotlite is composed of a fine interlocking mass of fibers. The diopside has a light green color and occurs as large radiating groups of crystals projecting outward from the contact with xonotlite. The diopside does not show crystal outlines at the contact with xonotlite, but ends in an irregular outline. The xonotlite is found included in the diopside in decreasing amounts away from the contact as indicated in figure 2. The xonotlite is apparently free from diopside except along the irregular contact. The mode of occurrence of this xonotlite and the associated minerals are apparently quite different from the other described occurrences.