CATAPLEIITE FROM MAGNET COVE, ARKANSAS

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The mineral catapleiite was first found in the nepheline syenites on the Island of Låven, Langesundfjord, Norway. Later it was discovered in other localities in the Langesundfjord region. It has again been found at the famous Narsarsuk locality near Fredrickshavn, western Greenland, where it occurs as one of the most abundant minerals in the syenites of that locality. The writer, while examining a number of specimens from the syenite localities about Magnet Cove, Arkansas, noted some small yellowish, hexagonal plates that proved upon examination to be catapleiite. The syenites of Magnet Cove are remarkably poor in titanium and zirconium minerals as compared to similar syenites in Norway and Greenland, and the discovery of catapleiite at this locality is not entirely unexpected.

The specimens carrying the catapleiite are dike rocks made up of feldspar and aegirite, with accessory titanite and secondary natrolite. The aegirite occurs in two forms; lustrous black prisms up to 3 cm. in length ramifying in all directions through the feldspar and projecting into mariolitic cavities; and small acicular needles of a brown color forming radiating masses on the other minerals. The feldspars are somewhat dull and contain numerous solution cavities in which occur groups of catapleiite crystals. Similar specimens having a less corroded appearance carry eudialyte and eucolite but no catapleiite.

The catapleiite forms hexagonal plates up to 3 mm. in diameter and 1 mm. in thickness. Single crystals are rare, the common occurrence being in crystal aggregates. The color is yellow (ivory yellow) sometimes with a faint suggestion of pink. They are not transparent but translucent, usually somewhat porcelain-like in appearance. The forms noted (referred to the hexagonal system) are $0001, 10\bar{1}1, 10\bar{1}2$, and $10\bar{1}0$. The faces gave good signals but the measurements did not show very close agreement among themselves. This has also been found to be true of the specimens of the mineral from other localities. The following angles are sufficiently close to those of catapleiite as to leave no doubt as to their form.

	MAGNET COVE	NORWAY	GREENLAND
$10\bar{1}2 \wedge 0001$	37°33′	38°12′	37°57′
$10\bar{1}1 \wedge 0001$	56°32′	57°34′	57°20′

The Greenland mineral often shows a striking iridescence, the base giving red reflections, the prism blue or green. On the goniometer the Magnet Cove mineral shows a striking red reflection from the base.

The catapleiite from Magnet Cove is positive in optical character with small axial angle. The angle varies somewhat from 0° to 15°. Much of the material is essentially uniaxial, other specimens show a decided opening of the cross. A comparison of the optical properties of the Magnet Cove material with that of Greenland is given in the table below:

OPTICAL PROPERTIES OF CATAPLEIITE

	MAGNET COVE	GREENLAND
α	1.593	1.591
β	1.593	1.592
γ	1.628	1.627
2V	0°–15°	25°
Character	positive	positive
Orientation	$Z=c$	$Z=c$

A sufficient amount of material was not available for analysis but the optical and crystallographical properties of the mineral place it quite definitely as catapleiite.

The catapleiite specimens are free of eudialyte and eucolite while the eudialyte-eucolite bearing rock is fresher and shows no catapleiite. Brögger remarks that the Norway catapleiite bearing rock is also remarkably free of eudialyte-eucolite. Grains of eudialyte are common showing alteration to eucolite. The catapleiite occurs commonly in the solution cavities in the feldspar, is decidedly later than the other minerals and appears to be contemporaneous with the zeolites. These relations indicate a derivation of the catapleiite from eudialyte through eucolite by hydration.

Although catapleiite does not seem to have been noted before at Magnet Cove, Williams[1] makes the following statement under the heading "Brucite." "Brucite occurs in white transparent or semi-transparent regular hexagonal plates which are generally about 2 mm. in diameter but may be found much smaller. They present a laminated surface and show a decided cleavage parallel to the base. The faces which have been observed are 0001, $20\bar{2}1$, $04\bar{4}1$. The angles were not measured but it is evident from

[1] Annual Report of the Geological Survey of Arkansas, vol. 2, 1890.

the appearance of the crystal that the faces enumerated are those which exist. In parallel light a plate parallel to the base becomes dark grey but shows variations of intensity in the different parts of the plates. In convergent light a black cross is observed which opens slightly when the stage is revolved. The size of the optic angle in different parts of the plate is very variable from one point to another. By means of a quarter undulation mica plate the character of the double refractions was determined as positive." This description fits that of catapleiite in so many respects as to leave little doubt of the identity of this mineral with catapleiite.

A NEW MODE OF OCCURRENCE OF STRUVITE[1]

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In the summer of 1920 the writer received from Mr. C. H. Hickey of the Food and Drug Inspection Station in Boston some crystals, the identification of which was desired. The crystals were found in canned shrimp from Biloxi, Miss. Attention had been called to them by their hard, gritty character and their insolubility in either hot or cold water.

One of the few, minute, white crystals submitted proved measurable on the goniometer. It was found to be a twin crystal of orthorhombic system but in the absence of any chemical data its nature was not established. Later more of the material was secured by the chemists of the Station and qualitative tests were obtained for magnesium, ammonia and phosphorus. With this information it was easy to identify the crystal as struvite and renewed study of the forms revealed the characteristic hemimorphism of that mineral. As shown in the figure the crystal was elongated in the direction of the *a* axis, twinned on the basal pinacoid, and deeply grooved on both sides. Other crystals were flattened parallel to the twin plane. They showed cleavage and optical characters which agreed with the data given for struvite in Dana (Syst. p. 806).

The forms observed were the following:—$b(010)$; $c(001)$; $p(120)$; $S(101)$; $s_1(10\bar{1})$; $h(021)$; $h_1(02\bar{1})$; $t(121)$.

The reflections were poor but the following angles show the nature of the agreement of measured with calculated values:—

[1] These crystallographic notes and the figure of struvite have already been published in a paper by C. S. Purcell and C. H. Hickey. Note on an Occurrence of Struvite in Canned Shrimps, *The Analyst;* London. A reprint seemed desirable.