NOTES AND NEWS

STUDIES OF URANIUM MINERALS (XVI): AN ALTERATION PRODUCT OF IANTHINITE[1]

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A specimen from Katanga labeled ianthinite and consisting of purple-colored minute needles and laths was sent by J. F. Vaes to the Harvard University mineral collection several years ago. The mineral resembles ianthinite in the hand specimen, but chemical analysis gave only a trace of UO_2 and a formula of $UO_3 \cdot 2H_2O$ (Table 1), although ianthinite reportedly contains only quadrivalent uranium and has a formula of $2UO_2 \cdot 7H_2O$ (Schoep, 1930). The mineral probably is an alteration product of ianthinite in which the U^4 is almost completely oxidized to U^6; it may be epiianthinite, inadequately described by Schoep and Stradiot (1947). The purple color of the mineral is due to the trace of UO_2. Although epiianthinite is yellow, the optical properties of the alteration product are more like those of epiianthinite than those of ianthinite (Table 2).

TABLE 1. CHEMICAL ANALYSES OF IANTHINITE AND OF AN ALTERATION PRODUCT OF IANTHINITE

	1	2	3	4
UO_2	<0.1	—	—	—
UO_3	87.83	88.64	88.60	—
U_3O_8	—	—	—	82.90
H_2O-	1.06			15.85 (ignition loss)
H_2O+	11.26	11.36	11.40	—
Fe_2O_3	—	—	—	1.25
Total	100.15	100.00	100.00	100.00

1. Alteration production of ianthinite; analyst, Frank Cuttitta.
2. Analysis 1 recalculated to 100 after deducting H_2O-.
3. Theoretical composition $UO_3 \cdot 2\ H_2O$.
4. Ianthinite (Schoep, 1930).

The *x*-ray powder pattern (Table 3) of the alteration product is distinctive and cannot be confused with that of schoepite, which has practically the same chemical composition. Authentic *x*-ray powder data are lacking for ianthinite and epiianthinite. *X*-ray Weissenberg study, using copper radiation, gave sharp lattice patterns with $a_0 = 7.17$ Å, $b_0 = 11.46$ Å,

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TABLE 2. OPTICS OF IANTHINITE, EPIIANTHINITE, AND ALTERATION PRODUCT OF IANTHINITE

Ianthinite[1]	Epiianthinite[2]	Alteration product of ianthinite
$\alpha=1.674$	1.70	1.695
$\beta=1.90$	1.79	1.730
$\gamma=1.92$	1.793	1.790
2V (−) small	(−) Small)	(−)∼50°
a = colorless	$X=c$, pale yellow	$X=c$, pale pink
c = violet	$Y=b$, yellow	$Y=b$, brownish orange
b = dark violet	$Z=a$, deep yellow	$Z=a$, dark reddish purple
Orthorhombic	Orthorhombic	Orthorhombic

[1] Schoep (1930).
[2] Schoep and Stradiot (1947).

TABLE 3. d-SPACINGS FOR ALTERATION PRODUCT OF IANTHINITE

(Copper radiation, nickel filter, in $\lambda=1.5418$Å)

d	I	d	I
7.63	10	1.673	4
5.37	2	1.632	2
4.13	4	1.615	2
3.78	9	1.595	2
3.60	3	1.574	5
3.36	7	1.541	1
3.20	8	1.510	1
2.96	6	1.470	1
2.67	5	1.436	3
2.60	1	1.405	1
2.51	5	1.380	1
2.38	4	1.343	2
2.29	2	1.313	4
2.24	2	1.256	2
2.14	5	1.226	3
2.06	2	1.168	1
2.03	3	1.158	1
1.978	2	1.139	3
1.950	2	1.127	3
1.915	2	1.115	2
1.889	4	1.102	1
1.833	2	1.086	3
1.783	3	1.067	2
1.756	1	1.027	4
1.734	2	1.009	1

and $c_0 = 15.20$ Å; $a_0:b_0:c_0 = 0.6257:1:1.311$. The measured specific gravity is slightly less than 3.5 (minute needles of the mineral rose very slowly to the surface of Clerici solution of sp. gr. = 3.503), and the calculated specific gravity is 3.467, assuming 8 formula units of $UO_3 \cdot 2H_2O$ per unit cell.

This study is part of a program undertaken by the Geological Survey on behalf of the Division of Raw Materials of the Atomic Energy commission.

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ANALYSES AND INDICES OF REFRACTION OF TOURMALINE FROM FAULT GOUGE NEAR BARSTOW, SAN BERNARDINO COUNTY, CALIFORNIA[1]

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Blue cryptocrystalline tourmaline is the principal mineral in massive, pale-blue fault gouge[2] 3.5 miles north of Barstow, California. T. W. Dibblee, Jr., of the U. S. Geological Survey, collected samples from the north side of a low ridge in the SE$\frac{1}{4}$ sec. 18, T. 10 N., R. 1 W., San Bernardino base and meridian (lat. 34° 57′ N., long. 117° 00′ W.). According to Dibblee (personal communication) the blue tourmaline rock, a lenticular mass roughly 30 feet long and 10 feet wide, occurs in a local shear zone in fine-textured, poorly bedded, greenish-brown lime-silicate rock within a thick series of dark-gray biotite-hornblende-feldspar schists.[3]

An x-ray diffraction pattern of purified material is in close agreement with standard tourmaline patterns cited by the American Society for Testing Materials. Spacings of $d/n(A)$ calculated from the hexagonal unit-cell dimensions $a_0 = 15.96$ Å, $c_0 = 7.16$ Å (Buerger and Parrish, 1937) are in reasonable accord with experimental values found on Barstow tourmaline.

Microscopically, this tourmaline is gray-green and cryptocrystalline

[1] Publication authorized by the Director, U. S. Geological Survey.

[2] Pale blue 5B 6/2, Rock-Color Chart, *Geol. Soc. Am.* (1951).

[3] Subsequently, two other occurrences of blue tourmaline rock similar to that described above were found on the same ridge, one about 300 feet to the southeast and the other about 1200 feet to the west. In both these localities the tourmaline rock occurs at the contact between the metamorphic rocks and a small andesite body capping the hill.