FIG. 1. Calcite with epitaxis
of magnesite.
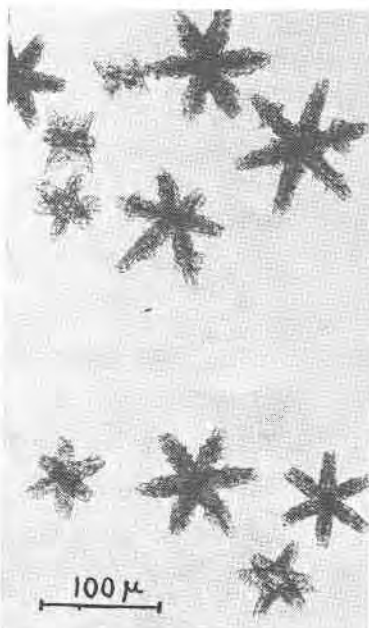
FIG. 2. Starshaped crystals
of dolomite.

fraction patterns and by chemical analyses. These gave for the rhombo-
hedral crystals: MgO 21.3%, CaO 29.8, organic residue insoluble in HCl
2n 2.2, loss on ignition 46.2, and for the starshaped crystals: MgO 22.4,
CaO 31.2, residue 0.2, loss on ignition 46.4.

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THE UNIT CELL OF KRAUSITE[1]

EDWARD J. GRAEBER, *Sandia Corporation, Albuquerque* AND
ABRAHAM ROSENZWEIG, *University of New Mexico, Albuquerque*

The mineral krausite, an anisodesmic oxysalt of potassium and iron,
was discovered in association with alunite and coquimbite at Borate in

the Calico Hills, San Bernardino County, California. It was described by Foshag (1931), who gave the composition as $K_2SO_4 \cdot Fe_2(SO_4)_3 \cdot 2H_2O$.

The sample of krausite available to the authors from the above locality consisted of an aggregate of pale-yellow short prismatic crystals less than 1.0 mm. in length. Brilliant crystals of approximately 0.5 mm diameter were chosen for single crystal studies.

Measurements of the unit-cell dimensions from single crystal photographs as well as from powder photographs (Fe $K\alpha$ radiation) led to the following lattice constants:

$$a = 7.910 \pm 0.01 \text{ Å} \qquad \beta = 102°45' \pm 5'$$
$$b = 5.152 \pm 0.005 \text{ Å} \qquad V = 357.2 \text{ Å}^3$$
$$c = 8.990 \pm 0.01 \text{ Å} \qquad a:b:c: = 1.535:1:1.745$$

These values are in better agreement with the morphological constants reported by Foshag (1931) than with the recalculated values reported by LaForge (Palache; *et al.*, 1951). For a unit cell containing two molecules $KFe(SO_4)_2 \cdot H_2O$, a density of 2.839 g.cm^{-3} was calculated; the measured density is 2.840 g.cm^{-3} (Foshag, 1931).

X-ray diffraction patterns were obtained of the h0l, h1l, h2l levels by the Weissenberg method (Fe $K\alpha$ radiation) and the 0kl, h0l levels by the precession method (Mo $K\alpha$ radiation). The only systematic extinctions were of the type 0k0 absent for k odd, indicating that the space group is either $P2_1$ or $P2_1/m$.

The morphology is consistent with $2/m$ point symmetry. Etch pits produced by dilute hydrochloric acid on (001) cleavage surfaces indicate the presence of a mirror. Statistical distribution of observed diffraction intensities according to the method of Howells *et al.* (1950) is in agreement with that of a centrosymmetric structure. Reflections of the type h0l were omitted from this calculation because either space group would appear centric when projected onto the a–c plane. It appears that $P2_1/m$ is the correct space group.

There is an apparent relationship among the unit cell dimensions of yavapaiite (Hutton, 1959), goldichite (Rosenzweig and Gross, 1955), and krausite, particularly in the b axis lengths as shown in Table I. Hutton (1959) pointed out the similarity between these compounds in regard

TABLE I

Name	Composition	S.G.	Z	a	b	c	β
Yavapaiite	$KFe(SO_4)_2$	$C2/m$ (?)	2	8.12	5.14	7.82	94°24'
Krausite	$KFe(SO_4)_2 \cdot H_2O$	$P2_1/m$	2	7.908	5.152	8.988	102°45'
Goldichite	$KFe(SO_4)_2 \cdot 4H_2O$	$P2_1/c$	4	10.45	10.53	9.15	101°49'

TABLE II. X-RAY POWDER DATA FOR KRAUSITE
FeKα radiation, camera diameter 114.6 mm

d_{obs} Å	I_{obs}	d_{calc} Å	hkl
8.82	4	8.77	001
7.75	37	7.71	100
6.59	66	6.55	10$\bar{1}$
4.40	74	4.38	002
4.26	45	4.23	10$\bar{2}$
4.06	9	4.05	11$\bar{1}$
3.86	2	3.86	200
3.69	64	3.68	111
3.51	22	3.49	102
3.35	2	3.34	012
3.28	18	3.27	201
3.09	100	3.09	21$\bar{1}$
		3.09	210
2.970	9	2.958	10$\bar{3}$
2.933	6	2.922	003
2.901	3	2.891	112
2.768	40	2.765	21$\bar{2}$
		2.762	211
2.627	6	2.629	30$\bar{1}$
2.579	38	2.576	020
2.546	38	2.542	013
2.342	2	2.342	31$\bar{1}$
2.302	6	2.300	310
		2.286	113
2.251	2	2.242	10$\bar{4}$
2.199	4	2.221	022
		2.201	12$\bar{2}$
2.191	4	2.191	004
		2.185	30$\bar{3}$
2.146	7	2.142	22$\bar{1}$
		2.142	220
2.078	4	2.073	122
2.025	10	2.025	22$\bar{2}$
		2.024	221
		2.016	014
2.001	3	1.995	104
1.964	3		
1.928	2		
1.893	2		
1.840	18		
1.806	5		
1.773	3		
1.753	7		
1.731	1		
1.703	1		
1.665	2		
1.637	3		
1.570	7		
1.545	4		
1.524	2		
1.480	8		
1.449	20		
1.415	4		
1.288	4		
1.275	10		

to the optical properties and cleavage. It is noteworthy that in krausite and yavapaiite the *b* axis coincides with the optically slow direction Z; but in goldichite, where that axis is doubled, it coincides with the fast direction X.

X-ray powder diffraction data for Fe Kα radiation is given in Table II; the intensities were measured by a double-beam recording microdensitometer. The crystal structures of krausite and its related hydrates are currently under investigation.

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FURTHER DATA ON THE UNIT CELL AND SPACE GROUP OF CHERALITE

N. NAGARAJA RAO[1], *Atomic Minerals Division, Department of Atomic Energy, New Delhi, India*

AND

J. J. FINNEY, *Department of Geological Engineering, Colorado School of Mines, Golden, Colorado.*

Bowie and Horne (1953) described cheralite as a green mineral belonging to the monazite group intermediate in composition between monazite and the compound $CaTh(PO_4)_2$. They presented chemical analyses from two supposedly different localities: Kuttakuzhi, Travancore, India and Cootykad Pothay, Vilavancode taluq, Travancore. These localities are now confirmed by the senior author to be one and the same. Bowie and Horne included approximate unit cell dimensions based on powder data and concluded that monazite and cheralite are isostructural.

Khubchandani (1956) determined the unit cell dimensions and space group of cheralite from rotation and equatorial Weissenberg photographs. He reported the space group as $P\ 2_1/n$, C_{2h}^5, identical to that listed for monazite.

[1] Present address: Department of Geological Engineering, Colorado School of Mines, Golden, Colorado.