Crystal Data: Monoclinic. *Point Group:* $2/m$. As crystals, flattened on [010], to 2 mm, in parallel or radiating groups; foliated, nodular or reniform, massive.

Physical Properties: *Cleavage:* One, perfect, parallel foliation; another, interrupted, perpendicular to the first; a third, also interrupted, oblique to the first. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 2.51–2.53 D(calc.) = 2.65

Optical Properties: Transparent to translucent, opaque if massive. *Color:* Sulfur-yellow, greenish yellow to siskin-green, yellowish white; yellow in transmitted light. *Streak:* Sulfur-yellow to white. *Luster:* Pearly on cleavages.
Optical Class: Biaxial (–). *Orientation:* $Z = b$; $X \wedge c = 61.5°$. *Dispersion:* $r < v$, strong.
$\alpha = 1.572–1.604$ $\beta = 1.579–1.610$ $\gamma = 1.583–1.612$ 2V(meas.) = 70°–80°

Cell Data: *Space Group:* $C2/c$. $a = 10.34(2)$ $b = 24.20(2)$ $c = 6.31(2)$ $\beta = 91°30'$
$Z = 2$

X-ray Powder Pattern: Kara-Tau Range, Kazakhstan.
12.10 (10), 2.903 (9), 2.652 (9), 2.592 (9), 1.578 (9b), 3.149 (7), 6.05 (6)

Chemistry:

	(1)	(2)	(3)
P_2O_5	34.01	34.00	34.8
SiO_2		0.10	
Al_2O_3	2.90	8.00	6.8
Fe_2O_3	24.34	12.80	15.4
Cr_2O_3		0.50	
CuO		0.35	
MgO	2.65	3.20	3.2
CaO	14.81	17.30	17.8
H_2O^+		22.10	
H_2O^-		1.50	
H_2O	20.56		[22.0]
Total	99.27	99.85	[100.0]

(1) The Battenberg, Germany; Fe^{2+}:Fe^{3+} from stoichiometry; corresponds to $(Ca_{3.31}Fe^{2+}_{0.36})_{\Sigma=3.67}(Mg_{0.83}Fe^{2+}_{0.17})_{\Sigma=1.00}(Fe^{3+}_{3.29}Al_{0.71})_{\Sigma=4.00}(PO_4)_6(OH)_{3.34} \cdot 12.61H_2O$. (2) Kara-Tau Range, Kazakhstan; corresponding to $Ca_{3.88}Mg_{1.00}(Fe^{3+}_{2.08}Al_{1.97})_{\Sigma=3.99}(PO_4)_{6.02}(OH)_4 \cdot 12.85H_2O$.
(3) Moculta quarry, Australia; by electron microprobe, total Fe as Fe_2O_3, H_2O by difference; corresponding to $Ca_{3.88}Mg_{0.97}(Fe^{3+}_{2.36}Al_{1.63})_{\Sigma=3.99}(PO_4)_6(OH)_{3.67} \cdot 13.11H_2O$.

Mineral Group: Montgomeryite group.

Occurrence: As nodules in a bed of Tertiary clay (The Battenberg, Germany); in phosphatic clay (Moculta quarry, Australia).

Association: Montgomeryite, jarosite, cacoxenite, tinticite, apatite, pyrite (Moculta quarry, Australia).

Distribution: In Germany, on the Battenberg, and from Hagendorf, Bavaria. On Sal Island, Cape Verde Islands. In the Moculta phosphate quarry, northeast of Angaston, South Australia. From an undefined locality in the Kara-Tau Range, Kazakhstan.

Name: For CALCIum and iron, FERRum, in the composition.

Type Material: Type material is claimed to have been analyzed by (2) Mead and Mrose, but no further details are given.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 976–977. (2) Mead, C.W. and M.E. Mrose (1968) Solving problems in phosphate mineralogy with the electron probe. U.S. Geol. Surv. Prof. Paper 600-D, D204–D206. (3) Dunn, P.J., W.L. Roberts, T.J. Campbell, and P.B. Leavens (1983) Red montgomeryite and associated minerals from the Tip Top pegmatite with notes on kingsmountite and calcioferrite. Mineral. Record, 14, 195–197. (4) Ankinovich, E.A., S.G. Ankinovich, A.A. Dara, and F.A. Kurmakaeva (1983) Ferrous montgomeryite of the Kara-Tau. Zap. Vses. Mineral. Obshch., 112, 84–88 (in Russian with English abs.). (5) Henderson, W.A., Jr. and V. Peisley (1985) Calcioferrite from the Moculta quarry near Angaston, South Australia. Mineral. Record, 16, 477–480.