Bartonite $K_3Fe_{10}S_{14}$

Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. Anhedral masses, intergrown with pyrrhotite; rare elongated single crystals, to 50 μm long.

Physical Properties: *Cleavage:* {112}, distinct. *Fracture:* Conchoidal. Hardness = 3.5 VHN = 94–120, 104 average (15 g load). D(meas.) = 3.305 D(calc.) = 3.286 Weakly magnetic.

Optical Properties: Opaque. *Color:* Blackish brown; in polished section, yellowish green-gray to yellowish green-brown. *Streak:* Black. *Luster:* Submetallic. *Pleochroism:* Very weak. R_1–R_2: (400) 21.7–18.3, (420) 16.7–14.4, (440) 17.7–17.2, (460) 18.4–18.6, (480) 19.4–19.5, (500) 19.7–20.6, (520) 20.3–21.4, (540) 20.9–21.8, (560) 21.9–22.7, (580) 22.7–23.2, (600) 23.4–23.7, (620) 23.9–24.3, (640) 24.7–25.1, (660) 25.0–25.5, (680) 25.2–26.1, (700) 26.4–26.5

Cell Data: *Space Group:* $I4/mmm$. $a = 10.424(1)$ $c = 20.626(1)$ $Z = 2$

X-ray Powder Pattern: Coyote Peak, California, USA.
2.998 (100), 5.99 (77), 1.833 (40), 9.31 (27), 3.139 (27), 2.379 (25), 1.841 (25)

Chemistry:

	(1)	(2)
K	9.54	10.43
Na	0.05	
Fe	51.2	49.66
Cu	0.62	
Ni	0.19	
Co	0.11	
S	38.4	39.91
Cl	0.02	
Total	100.13	100.00

(1) Coyote Peak, California, USA; by electron microprobe, corresponding to $(K_{2.78}Na_{0.07})_{\Sigma=2.85}(Fe_{10.46}Cu_{0.10}Ni_{0.04}Co_{0.02})_{\Sigma=10.62}S_{13.46}$. (2) $K_3Fe_{10}S_{14}$.

Occurrence: In clots with other sulfides and silicates in an alkalic diatreme which intruded Franciscan rocks.

Association: Rasvumite, djerfisherite, erdite, pyrrhotite, pyrite, sphalerite, löllingite, magnetite, nepheline, phlogopite.

Distribution: From Coyote Peak, near Orick, Humboldt Co., California, USA [TL].

Name: For Paul Booth Barton, Jr. (1930–), ore petrologist with the U.S. Geological Survey.

Type Material: National Museum of Natural History, Washington, D.C., USA, 149498.

References: (1) Czamanske, G.K., R.C. Erd, B.F. Leonard, and J.R. Clark (1981) Bartonite, a new potassium iron sulfide mineral. Amer. Mineral., 66, 369–375. (2) Evans, H.T., Jr. and J.R. Clark (1981) The crystal structure of bartonite, a potassium iron sulfide, and its relationship to pentlandite and djerfisherite. Amer. Mineral., 66, 376–384.