Devitoite $Ba_6(PO_4)_2(CO_3)Fe^{2+}_7Fe^{3+}_2(Si_4O_{12})_2O_2(OH)_4$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. Crystals, bladed, flattened on {001}, elongate and striated parallel to [100] with no terminations, to 5 mm; typically in subparallel intergrowths.

Physical Properties: *Cleavage*: Perfect on {001}, good on {010}. *Fracture*: Irregular. *Tenacity*: Flexible. Hardness = ~ 4 D(meas.) = n.d. D(calc.) = 4.044

Optical Properties: Transparent to translucent. *Color*: Brown. *Streak*: Cream to pale brown. *Luster*: Silky.
Optical Class: Biaxial (+). $\alpha = 1.730(3)$ $\beta = 1.735(6)$ $\gamma = 1.755(3)$ 2V(meas.) = n.d. 2V(calc.) = 53.6° *Pleochroism*: Brown. *Absorption*: Y >>> X > Z. *Orientation*: X ≈ *b*; Y ≈ *c*; Z ≈ *a*.

Cell Data: *Space Group*: $P\bar{1}$. $a = 5.3437(7)$ $b = 11.6726(15)$ $c = 14.680(2)$ $\alpha = 91.337(4)°$ $\beta = 96.757(4)°$ $\gamma = 103.233(4)°$ $Z = 1$

X-ray Powder Pattern: Esquire #8 claim, eastern Fresno County, California, USA.
2.911 (100), 2.665 (100), 3.629 (73), 1.5597 (73b), 3.457 (70), 2.089 (66), 3.859 (62)

Chemistry:

	(1)	(2)
SiO_2	19.60	20.97
TiO_2	0.75	0.80
Al_2O_3	1.40	1.50
Fe_2O_3		6.08
FeO	25.70	22.02
MgO	0.70	0.75
CaO	0.47	0.50
BaO	36.30	38.83
P_2O_5	4.52	4.84
H_2O		1.67
CO_2		2.04
Total	89.44	100.00

(1) Esquire #8 claim, eastern Fresno County, California, USA; electron microprobe analysis, CO_3 and OH confirmed by IR and calculated from structure refinement, corresponding to $(Ba_{5.45}Ca_{0.19})_{\Sigma=5.64}(PO_4)_{1.47}O_{0.30}(CO_3)(Fe^{2+}_{6.60}Mg_{0.40})_{\Sigma=7}(Fe^{3+}_{1.64}Ti^{4+}_{0.22}Al^{3+}_{0.14})_{\Sigma=2}$ $(Si_{7.51}Al_{0.49})_{\Sigma=8}O_{26}(OH)_4$. (2) $Ba_6(PO_4)_2(CO_3)Fe^{2+}_7Fe^{3+}_2(Si_4O_{12})_2O_2(OH)_4$.

Occurrence: An alteration product of gillepsite along fractures and parting planes in a sanbornite-bearing rock.

Association: Gillespite, titantaramellite, celsian, sanbornite, anandite, quartz, the Fe^{2+} analogue of ericssonite (California); gillespite, titantaramellite, fencooperite (Arizona).

Distribution: Esquire #8 and #7 claims along Big Creek in SE¼ SW¼, Section 22, T11S, R25E, Mount Diablo Meridian, eastern Fresno County, California; Trumbull Peak, Maricopa Co., Arizona, USA.

Name: Honors Alfred (Fred) Devito (1937–2004) a prominent mineral collector (micromounts), field collector and contributor to the California mineralogical community.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (catalog nos. 61591, 61592, 61593, 61594).

References: (1) Kampf, A.R., G.R. Rossman, I.M. Steele, J.J. Pluth, G.E. Dunning, and R.E. Walstrom (2010) Devitoite, a new heterophyllosilicate mineral with astrophyllite-like layers from eastern Fresno County, California. Can. Mineral., 48, 29–40. (2) (2010) Amer. Mineral., 95, 1596-1597 (abs. ref. 1).