Gillespite $BaFe^{2+}Si_4O_{10}$

Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. As crystalline masses, to 2 cm, and embedded grains.

Physical Properties: *Cleavage:* Very good on {001}, poor on {100}; very poor on {110}. *Tenacity:* Brittle. Hardness = 3–4 D(meas.) = 3.390–3.402 D(calc.) = 3.404

Optical Properties: Translucent. *Color:* Deep red, rose-red. *Streak:* Pink.
Luster: Vitreous.
Optical Class: Uniaxial (–). *Pleochroism:* Strong; O = colorless; E = red. $\omega = 1.619–1.621$
$\epsilon = 1.618–1.620$

Cell Data: *Space Group:* $P4/ncc$. a = 7.5164(6) $c = 16.0768(10)$ Z = 4

X-ray Powder Pattern: Dry Delta, Alaska, and near Incline, California, USA. (ICDD 3-402).
3.39 (100), 4.41 (70), 3.22 (70), 3.09 (50), 2.65 (5), 2.39 (50), 8.02 (40)

Chemistry:

	(1)	(2)
SiO_2	50.08	51.63
TiO_2	0.00	
Al_2O_3	0.34	
Fe_2O_3	0.56	
Mn_2O_3	0.14	
FeO	14.60	15.43
BaO	31.02	32.94
LOI	0.82	
insol.	2.20	
Total	99.76	100.00

(1) Dry Delta, Alaska, USA; nearly pure material, corrected for assumed oxidation of FeO to Fe_2O_3, loss on ignition taken as H_2O. (2) $BaFeSi_4O_{10}$.

Occurrence: In a glacial moraine (Dry Delta, Alaska, USA); probably from a contact metamorphic zone (Trumbull Peak, California, USA).

Association: Celsian, hedenbergite, quartz (Dry Delta, Alaska, USA); sanbornite, celsian, diopside, tourmaline, quartz, pyrrhotite (Trumbull Peak, California, USA); pellyite, sanbornite, taramellite, fresnoite, muirite, barite (Itsy Mountains, Canada).

Distribution: In the USA, near the head of Dry Delta, Alaska Range, Alaska; from Trumbull Peak, near Incline, Mariposa Co., and on the Esquire No. 7 claim, Big Creek, Fresno Co., California. On the Gunn claim, in the Itsy Mountains, near Macmillan Pass, Yukon Territory, Canada. In the La Madrelena mine, Tres Pozos, Baja California, Mexico.

Name: For Frank Gillespie, of Richardson, Alaska, USA, who discovered the first specimen.

Type Material: Harvard University, Cambridge, Massachusetts, 90622; National Museum of Natural History, Washington, D.C., USA, 94347.

References: (1) Schaller, W.T. (1922) Gillespite, a new mineral. J. Wash. Acad. Sci., 123, 7–8. (2) Schaller, W. (1929) The properties and associated minerals of gillespite. Amer. Mineral., 14, 319–322. (3) Pabst A. (1943) Crystal structure of gillespite, $BaFeSi_4O_{10}$. Amer. Mineral., 28, 372–390. (4) Hazen, R.M. and C.W. Burnham (1974) The crystal structure of gillespite I and II: a structure determination at high pressure. Amer. Mineral., 59, 1166–1176.