Alleghanyite $Mn_5^{2+}(SiO_4)_2(OH)_2$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals rounded, slender; in stout plates, some deeply striated. As fan-shaped aggregates; commonly irregular, massive. *Twinning:* On {001}, lamellar, common; also on {105}, {305}.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 5.5
D(meas.) = 4.020 D(calc.) = [4.20]

Optical Properties: Transparent to translucent. *Color:* Pinkish to reddish brown, deep pink, grayish pink; in thin section, pink or buff in thick plates. *Luster:* Vitreous to dull.
Optical Class: Biaxial (–). *Pleochroism:* Pinks in thicker sections. *Orientation:* $Z = b$.
Dispersion: $r > v$. $\alpha = 1.756$ $\beta = 1.780$ $\gamma = 1.792$ 2V(meas.) = 72°

Cell Data: *Space Group:* $P2_1/c$. $a = 8.275$ $b = 4.850$ $c = 10.720$ $\beta = 104.64°$ Z = 2

X-ray Powder Pattern: Franklin, New Jersey, USA.
1.799 (10), 2.860 (8), 2.598 (6), 3.127 (5), 2.725 (5), 2.425 (5), 2.357 (5)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
SiO_2	24.90	24.65	24.38	MgO	2.16	0.78	
TiO_2	0.00	0.14		CaO	0.74	0.11	
Al_2O_3	trace	0.00		F		2.20	
Fe_2O_3	0.00			H_2O		[2.60]	3.66
FeO	1.40	0.84		$-O = F_2$		0.93	
MnO	70.35	70.15	71.96	Total	99.55	[100.54]	100.00

(1) Bald Knob, North Carolina, USA. (2) Do.; by electron microprobe; H_2O calculated from stoichiometry. (3) $Mn_5(SiO_4)_2(OH)_2$.

Polymorphism & Series: Dimorphous with ribbeite; forms a series with chondrodite.

Mineral Group: Humite group.

Occurrence: Hydrothermally deposited, in lenses in a manganese-bearing vein (Bald Knob, North Carolina, USA); in veins crosscutting franklinite ore near pegmatites in a metamorphosed stratiform Zn–Mn deposit (Franklin, New Jersey, USA).

Association: Spessartine, rhodonite, galaxite (Bald Knob, North Carolina, USA); kolicite, holdenite, magnussonite, adelite, kraisslite, chlorophoenicite, franklinite, willemite, barite, calcite (Sterling Hill, New Jersey, USA).

Distribution: In the USA, from Bald Knob, near Sparta, Alleghany Co., North Carolina; crystals from Franklin and Sterling Hill, Ogdensburg, Sussex Co., New Jersey; in the Germolis prospect, Fiddleton, Amador Co., and at Alum Rock Park, Santa Clara Co., California; at Eureka, Hinsdale Co., and the Sunnyside mine, San Juan Co., Colorado. In the Benallt mine, Rhiw, Lleyn Peninsula, Wales. From Långban, and in the Brattfors mine, Nordmark, Värmland, Sweden. In the Hanawa mine, Iwate Prefecture; the Kaso mine, Tochigi Prefecture; the Taguchi mine, Shidara, Aichi Prefecture; and the Rito mine and Hamayokokawa mine, Nagano Prefecture, Japan. In Kyrgyzstan, on Inyl'chek Ridge, Tien Shan.

Name: For the occurrence in Alleghany Co., North Carolina, USA.

Type Material: n.d.

References: (1) Ross, C.S. and P.F. Kerr (1932) The manganese minerals of a vein near Bald Knob, North Carolina. Amer. Mineral., 17, 1–18. (2) Rogers, A.F. (1935) The chemical formula and crystal system of alleghanyite. Amer. Mineral., 20, 25–35. (3) Rentzeperis, P.J. (1970) The crystal structure of alleghanyite, $Mn_5[(OH)_2|(SiO_4)_2]$. Zeits. Krist., 132, 1–18. (4) Winter, G.A., E.J. Essene, and D.R. Peacor (1983) Mn-humites from Bald Knob, North Carolina: mineralogy and phase equilibria. Amer. Mineral., 68, 951–959. (5) Dunn, P.J. (1985) Manganese humites and leucophoenicites from Franklin and Sterling Hill, New Jersey: parageneses, compositions, and implications for solid solution limits. Amer. Mineral., 70, 379–387.