Kittatinnyite $Ca_4Mn_2^{2+}Mn_4^{3+}Si_4O_{16}(OH)_8 \cdot 18H_2O$

Crystal Data: Hexagonal. *Point Group:* $6/m\ 2/m\ 2/m$, $6mm$, or $\overline{6}m2$. As very thin, distorted crystals, to 0.2 mm, flattened on {0001}, and in subparallel aggregates.

Physical Properties: *Cleavage:* {0001}, perfect. *Tenacity:* Brittle. Hardness = ∼4
D(meas.) = 2.61 D(calc.) = 2.62

Optical Properties: Translucent to opaque. *Color:* Bright to golden yellow; in thin section, medium yellow. *Streak:* Light yellow. *Luster:* Vitreous.
Optical Class: Uniaxial (–). *Pleochroism:* Very weak in medium yellow. *Absorption:* $E \geq O$.
$\omega = 1.727(3)$ $\epsilon =$ n.d.

Cell Data: *Space Group:* $P6_3/mmc$, $P6_3mc$, or $P\overline{6}2c$. a = 6.498(4) $c = 22.78(2)$ Z = 1

X-ray Powder Pattern: Franklin, New Jersey, USA.
11.2 (100), 5.61 (60), 2.733 (60), 2.822 (50), 2.525 (40), 2.279 (40), 5.03 (30)

Chemistry:

	(1)	(2)
SiO_2	18.2	18.23
Mn_2O_3	23.6	23.95
As_2O_5	0.8	
FeO	0.0	
MnO	10.6	10.76
CuO	0.0	
ZnO	0.3	
MgO	0.0	
CaO	17.3	17.01
H_2O	[29.2]	30.05
Total	[100.0]	100.00

(1) Franklin, New Jersey, USA; by electron microprobe, Mn^{2+}:Mn^{3+} from charge balance, H_2O by difference. (2) $Ca_4Mn_2^{2+}Mn_4^{3+}Si_4O_{16}(OH)_8 \cdot 18H_2O$.

Occurrence: A secondary mineral coating fractures in a metamorphosed stratiform zinc deposit.

Association: Bostwickite, calcite, franklinite, fluorite.

Distribution: From Franklin, Sussex Co., New Jersey, USA.

Name: Derived from *kittatinny*, which in the language of the Algonquin Indians meant *endless hills*, in allusion to the topography of the Franklin area.

Type Material: Harvard University, Cambridge, Massachusetts, 113514; National Museum of Natural History, Washington, D.C., USA, C4222.

References: (1) Dunn, P.J. and D.R. Peacor (1983) Kittatinnyite and wallkilldellite, silicate/arsenate analogues containing calcium and manganese, from Franklin and Sterling Hill, New Jersey. Amer. Mineral., 68, 1029–1032.