Quenselite $PbMn^{3+}O_2(OH)$

Crystal Data: Monoclinic. *Point Group:* $2/m$. As crystals, flattened on {010}, elongated ‖ [100] or [001], showing {100}, {010}, {001}, {011}, {101}, {$10\overline{3}$}, {111}; striated on {110} ‖ [100].

Physical Properties: *Cleavage:* Perfect on {001}, nearly micaceous. *Tenacity:* Flexible, in thin laminae; somewhat malleable. Hardness = 2.5 VHN = 171–268, average 221 (100 g load). D(meas.) = 6.84 D(calc.) = 7.133

Optical Properties: Opaque, translucent on thin edges. *Color:* Pitch-black; deep brown in transmitted light. *Streak:* Dark brownish gray. *Luster:* Metallic to adamantine. *Optical Class:* Biaxial (+) (?). *Orientation:* $X = b$; $Y \simeq c$. *Absorption:* $Z > X$. $n = \sim 2.30$ 2V(meas.) = n.d. *Anisotropism:* Strong.

R_1–R_2: (400) 28.1–32.6, (420) 26.7–30.9, (440) 25.3–29.2, (460) 24.0–27.7, (480) 23.0–26.3, (500) 22.1–25.1, (520) 21.4–24.2, (540) 20.8–23.4, (560) 20.4–22.8, (580) 20.0–22.2, (600) 19.7–21.8, (620) 19.5–21.5, (640) 19.4–21.3, (660) 19.2–21.0, (680) 19.2–20.9, (700) 19.2–20.9

Cell Data: *Space Group:* $P2/a$. $a = 5.61$ $b = 5.70$ $c = 9.15$ $\beta = 93.0°$ Z = 4

X-ray Powder Pattern: Långban, Sweden.
3.04 (10), 2.72 (8), 3.68 (7), 3.60 (7), 2.95 (6), 2.44 (4), 2.08 (4)

Chemistry:

	(1)	(2)
MnO	23.44	22.80
PbO	70.21	71.74
MgO	0.30	
CaO	0.15	
Na_2O	0.28	
K_2O	0.17	
O	2.40	2.57
H_2O	3.05	2.89
Total	[100.00]	100.00

(1) Långban, Sweden; recalculated to 100% after deduction of $CaCO_3$ 1.46%, Fe_2O_3 0.28%.
(2) $PbMnO_2(OH)$.

Occurrence: In a metamorphosed Fe–Mn orebody (Långban, Sweden).

Association: Calcite, barite, hausmannite, braunite (Långban, Sweden).

Distribution: From Långban, Värmland, Sweden. At Tirodi, Madhya Pradesh, India. From Luce Bay, Wigtownshire, Scotland.

Name: Honors Professor Percy Dudgeon Quensel (1881–1966), Swedish mineralogist and petrologist, Stockholm University, Stockholm, Sweden.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 729–730. (2) Rouse, R.C. (1971) The crystal structure of quenselite. Zeits. Krist., 134, 321–332. (3) Welin, E. (1968) X-ray powder data for minerals from Långban and the related mineral deposits of Central Sweden. Arkiv Mineral. Geol., 4(30), 499–541.