Sarkinite $Mn_2^{2+}(AsO_4)(OH)$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals typically thick tabular {100}, elongated, to 4 mm, short prismatic, or tabular along [010]. May be crudely spherical, granular massive.

Physical Properties: *Cleavage:* On {100}, distinct. *Fracture:* Subconchoidal to uneven. Hardness = 4–5 D(meas.) = 4.08–4.18 D(calc.) = 4.20

Optical Properties: Semitransparent. *Color:* Flesh-red to dark blood-red, rose-red, orange, orange-brown, brown, reddish yellow to yellow; pale rose to yellow in transmitted light. *Streak:* Rose-red to yellow. *Luster:* Greasy.
Optical Class: Biaxial (–). *Pleochroism:* Weak. *Orientation:* $Y = b$; $X \wedge c = -54°$. *Dispersion:* $r < v$. *Absorption:* $X > Z > Y$. $\alpha = 1.790–1.793$ $\beta = 1.794–1.807$ $\gamma = 1.798–1.809$ 2V(meas.) = 83°

Cell Data: *Space Group:* $P2_1/a$. $a = 12.779(2)$ $b = 13.596(2)$ $c = 10.208(2)$ $\beta = 108°53'$ Z = 16

X-ray Powder Pattern: Pajsberg [Harstigen mine, near Persberg], Sweden.
3.18 (10), 3.04 (10), 3.29 (9), 3.48 (8), 2.90 (7), 2.65 (6), 6.0 (3)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
P_2O_5	0.21			ZnO		0.15	
As_2O_5	41.60	44.09	43.23	PbO	0.25		
CO_2	0.76			MgO	0.98	0.19	
FeO	0.13	0.02		CaO	1.40	0.29	
MnO	51.60	51.77	53.38	H_2O	3.06	[3.40]	3.39
CuO		0.01		insol.	0.38		
				Total	100.37	[99.92]	100.00

(1) Pajsberg [Harstigen mine, near Persberg], Sweden. (2) Långban, Sweden; by electron microprobe, total Mn as MnO, original total given as 99.93%; corresponds to $(Mn_{1.93}Ca_{0.01}Mg_{0.01})_{\Sigma=1.95}(AsO_4)_{1.02}(OH)$. (3) $Mn_2(AsO_4)(OH)$.

Polymorphism & Series: Dimorphous with eveite.

Occurrence: Rare in metamorphosed Fe–Mn orebodies (Sweden); in manganese-rich lenses in quartzitic chlorite schists probably of marine origin (Ködnitz Valley, Austria); in metamorphosed stratiform zinc orebodies (New Jersey, USA).

Association: Lead, bementite, brandtite, calcite, barite (Harstigen mine, Sweden); katoptrite, magnetite, jacobsite, tephroite (Sjö mine, Sweden); tephroite, pyroxmangite, rhodonite, spessartine, rhodochrosite, tiragalloite (Ködnitz Valley, Austria); grischunite, brandtite, manganoan berzeliite, tilasite, rhodochrosite, braunite (Falotta mine, Switzerland); eveite, adamite, willemite, allactite, brandtite, parabrandtite, kraisslite, copper, euchroite, serpierite, rhodochrosite, barite, manganese oxides (Sterling Hill, New Jersey, USA).

Distribution: In Sweden, from the Harstigen mine, near Persberg, at the Brattfors mine, and from Långban, Värmland; in the Sjö mine, near Grythyttan, Örebro. In the Ködnitz Valley, Tirol, Austria. At the Falotta mine, Oberhalbstein, Graubünden, Switzerland. From Sterling Hill, Ogdensburg, and at Franklin, Sussex Co., New Jersey, USA.

Name: From the Greek for *made of flesh*, an allusion to the blood-red color and greasy luster.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 855–857. (2) Dal Negro, A., G. Giuseppetti, and J.M. Martin Pozas (1974) The crystal structure of sarkinite. Tschermaks Mineral. Petrog. Mitt., 21, 246–260. (3) Hålenius, U. and E. Westlund (1998) Manganese valency and the color of the $Mn_2AsO_4(OH)$ polymorphs eveite and sarkinite. Mineral. Mag., 62, 113–119. (4) Dunn, P.J. (1995) Franklin and Sterling Hill, New Jersey. No publisher, n.p., 680–682. (5) 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, esp. 533.