Gonyerite $(Mn^{2+},Mg)_5Fe^{3+}(Si_3Fe^{3+})O_{10}(OH)_8$

Crystal Data: Orthorhombic, pseudohexagonal. *Point Group:* n.d. In rounded, radial aggregates of lath- and plate-shaped crystals, to several mm; as tiny rosettes of intergrown pseudohexagonal plates.

Physical Properties: *Cleavage:* {001}, perfect. *Tenacity:* Cleavage foliae are flexible but inelastic. Hardness = 2.5 D(meas.) = 3.01(4) D(calc.) = 3.03

Optical Properties: Translucent. *Color:* Deep brown with reddish internal reflections, light chocolate-brown; in transmitted light, pale to dark brown.
Optical Class: Biaxial (–). *Pleochroism:* X = dark brown; Z = light brown. $\alpha = 1.646$ $\beta = 1.664$ $\gamma = 1.664$ 2V(meas.) = 0°

Cell Data: *Space Group:* n.d. $a = 5.47$ $b = 9.46$ $c = 28.8$ Z = [4]

X-ray Powder Pattern: Långban, Sweden.
7.23 (10), 3.61 (8), 4.79 (5), 1.574 (5), 14.6 (3), 2.697 (3), 1.634 (3)

Chemistry:

	(1)	(2)
SiO_2	33.06	32.35
Al_2O_3	0.58	0.57
Fe_2O_3	9.42	
FeO		7.30
MnO	33.83	35.50
ZnO	0.42	0.47
PbO	0.56	
MgO	11.55	10.26
CaO	0.07	0.08
F		< 0.05
Cl		0.05
H_2O^+	10.31	[9.89]
H_2O^-	0.02	
$-O = (F,Cl)_2$		[0.05]
Total	99.82	[96.47]

(1) Långban, Sweden; corresponds to $(Mn^{2+}_{3.25}Mg_{1.95}Fe^{3+}_{0.64}Zn_{0.04}Pb_{0.02}Ca_{0.01})_{\Sigma=5.91}$ $(Si_{3.75}Fe^{3+}_{0.17}Al_{0.08})_{\Sigma=4.00}[O_{10.20}(OH)_{7.80}]_{\Sigma=18.00}$. (2) Do.; by electron microprobe, H_2O calculated from stoichiometry; corresponds to $(Mn^{2+}_{3.64}Mg_{1.85}Fe_{0.74}Zn_{0.04}Ca_{0.01})_{\Sigma=6.28}$ $(Si_{3.92}Al_{0.08})_{\Sigma=4.00}O_{10}[(OH)_{7.99}Cl_{0.01}]_{\Sigma=8.00}$.

Mineral Group: Chlorite group.

Occurrence: In hydrothermal veinlets cutting skarn (Långban, Sweden).

Association: Caryopilite, bementite, berzeliite, barite, garnet (Långban, Sweden).

Distribution: From Långban, and at the Harstigen mine, near Persberg, Värmland, Sweden. In the Wessels mine, near Kuruman, Cape Province, South Africa.

Name: In honor of Forest A. Gonyer, analytical chemist in the Department of Mineralogy and Petrography, Harvard University, Cambridge, Massachusetts, USA.

Type Material: Harvard University, Cambridge, Massachusetts, 112842; National Museum of Natural History, Washington, D.C., USA, 106913; The Natural History Museum, London, England, 1956,190–191.

References: (1) Frondel, C. (1955) Two chlorites: gonyerite and melanolite. Amer. Mineral., 40, 1090–1094. (2) Peacor, D.R. and E.J. Essene (1980) Caryopilite – a member of the friedelite rather than the serpentine group. Amer. Mineral., 65, 335–339.