Sjögrenite $Mg_6Fe^{3+}_2(CO_3)(OH)_{16}\cdot 4H_2O$

Crystal Data: Hexagonal. *Point Group:* $6/m\ 2/m\ 2/m$. As broad basal plates bounded by rough pyramid and prism faces; commonly intergrown with pyroaurite.

Physical Properties: *Cleavage:* Perfect on {0001}. *Tenacity:* Laminae flexible, not elastic. Hardness = 2.5 D(meas.) = 2.11(3) D(calc.) = 2.11

Optical Properties: Transparent to nearly opaque. *Color:* Cream-white, pale yellow, orange, pale brown, nearly colorless; colorless in transmitted light. *Luster:* Waxy to vitreous, pearly on cleavages.
Optical Class: Uniaxial (–). *Pleochroism:* O = pale yellow to brown; E = colorless.
$\omega = 1.573(3)$ $\epsilon = 1.550(3)$

Cell Data: *Space Group:* $P6_3/mmc$. $a = 3.113(3)$ $c = 15.61(1)$ Z = 1/4

X-ray Powder Pattern: Långban, Sweden.
7.78 (10), 3.90 (6), 2.54 (5), 2.21 (5), 1.87 (5), 2.65 (4), 2.39 (3)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
SiO_2	0.41			MgO	35.44	35.9 – 43.1	36.55
Al_2O_3	0.11			H_2O	33.62		32.67
Fe_2O_3	23.19	24.3 – 26.5	24.13	CO_2	7.01		6.65
FeO	0.10			LOI		40.6	
MnO	0.28			Total	100.16		100.00

(1) Långban, Sweden; mixture of pyroaurite and sjögrenite. (2) Zlatogor intrusive, Kazakhstan; by electron microprobe, five partial elemental analyses, here converted to oxides. (3) $Mg_6Fe_2(CO_3)(OH)_{16}\cdot 4H_2O$.

Polymorphism & Series: Dimorphous with pyroaurite.

Mineral Group: Manasseite group.

Occurrence: In low-temperature hydrothermal veins in a metamorphosed Fe–Mn orebody (Långban, Sweden); in a vein in serpentinized dunite (Zlatogor intrusive, Kazakhstan); in a vein in a metamorphosed stratiform zinc orebody (Sterling Hill, New Jersey, USA).

Association: Pyroaurite, calcite (Långban, Sweden); pokrovskite, magnesite (Zlatogor intrusive, Kazakhstan); pyroaurite, willemite, chlorophoenicite, barite, sphalerite (Sterling Hill, New Jersey, USA).

Distribution: From Långban and Nordmark, Värmland, Sweden. In the Phlogopite mine, Kovdor massif, Kola Peninsula, Russia. From the Zlatogor layered intrusive, northern Kazakhstan. Found at Sterling Hill, Ogdensburg, Sussex Co., New Jersey, USA.

Name: For Stens Anders Hjalmar Sjögren (1856–1922), Swedish mineralogist, Professor of Mineralogy, University of Stockholm, Stockholm, Sweden.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 83907.

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