Svyazhinite $(Mg, Mn^{2+})(Al, Fe^{3+})(SO_4)_2F \cdot 14H_2O$

Crystal Data: Triclinic. *Point Group:* $\overline{1}$ or 1. As tabular crystals, elongated along $\{0\overline{1}4\}$, with wedgelike terminations, to 0.5 mm, showing dominant forms $\{0\overline{1}4\}$, $\{4\overline{1}0\}$, {110}, {210}, six other forms; forms nodular aggregates, which may be hollow. *Twinning:* On $\{0\overline{1}4\}$.

Physical Properties: *Cleavage:* {010}. Hardness = 2 D(meas.) = 1.67 D(calc.) = 1.69 Soluble in H_2O.

Optical Properties: Semitransparent. *Color:* Yellow; colorless in transmitted light.
Luster: Vitreous.
Optical Class: Biaxial (–). *Orientation:* $Y \wedge c \simeq 40°$; $Z \wedge a \simeq 25°$. $\alpha = 1.423(2)$ $\beta = 1.439(2)$ $\gamma = 1.444(2)$ 2V(meas.) = Small. 2V(calc.) = 57°

Cell Data: *Space Group:* $P\overline{1}$ or $P1$. $a = 6.217$ $b = 13.306$ $c = 6.255$ $\alpha = 90.09°$ $\beta = 93.50°$ $\gamma = 82.05°$ Z = 1

X-ray Powder Pattern: Ilmen Mountains, Russia.
4.91 (10), 5.68 (7), 4.40 (5), 4.15 (5), 2.824 (5), 2.84 (4.5), 3.39 (4)

Chemistry:

	(1)
SO_3	29.37
Al_2O_3	8.65
Fe_2O_3	1.90
MnO	3.07
MgO	4.18
CaO	0.38
F	3.42
Cl	0.17
H_2O	49.40
$-O = (F, Cl)_2$	1.48
Total	99.06

(1) Ilmen Mountains, Russia; by laser microprobe, corresponds to $(Mg_{0.57}Mn_{0.24}Ca_{0.04})_{\Sigma=0.85}(Al_{0.93}Fe_{0.13})_{\Sigma=1.06}(SO_4)_{2.00}(F_{0.98}Cl_{0.03})_{\Sigma=1.01} \cdot 14.96H_2O$.

Occurrence: A weathering product in fractures cutting pyrite–fluorite-bearing pyroxene–amphibole fenites.

Association: Gypsum, pickeringite, melanterite, copiapite, epsomite, jarosite, pyrite, fluorite.

Distribution: From near Miass, Ilmen Mountains, Southern Ural Mountains, Russia.

Name: Honors Nikolai Vasil'evich Svyazhin (1927–1967), Russian mineralogist, Ural Mining Institute, Sverdlovsk, Russia.

Type Material: Sverdlovsk Mining Institute, Sverdlovsk; Il'menskii Preserve Museum, Miass, iz4524; Mining Institute, St. Petersburg, 1509/1; Vernadsky Geological Museum, Moscow, 53493; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 82772.

References: (1) Chesnokov, B.V., L.F. Bazhenova, I.E. Kamentsev, V.O. Polyakov, and A.F. Bushmakin (1984) Svyazhinite, $(Mg, Mn, Ca)(Al, Fe^{3+})(SO_4)_2F \cdot 14H_2O$ – a new mineral. Zap. Vses. Mineral. Obshch., 113, 347–351 (in Russian). (2) (1985) Amer. Mineral., 70, 877 (abs. ref. 1). (3) Pekov, I.V. (1998) Minerals first discovered on the territory of the former Soviet Union. Ocean Pictures, Moscow, 199.