Wollastonite $CaSiO_3$

Crystal Data: Monoclinic or triclinic. *Point Group:* $2/m$ or $\bar{1}$. Crystals tabular ∥ {100} or {001}, or short to long prismatic, to 20 cm. Commonly cleavable, parallel fibrous, or compact, massive. *Twinning:* Common; twin axis [010], composition plane {100}.

Physical Properties: *Cleavage:* {100} perfect; {001} and {$\bar{1}$02}, good; (100) ∧ (001) = 84.5°. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 4.5–5. D(meas.) = 2.86–3.09 D(calc.) = 2.90 May exhibit yellow catholuminescence.

Optical Properties: Transparent to translucent. *Color:* White, colorless, brown, red, yellow, pale green; colorless in thin section. *Streak:* White. *Luster:* Vitreous, pearly on cleavage. *Optical Class:* Biaxial (–). *Orientation:* $X \wedge c = 30°–44°$; $Y \wedge b = 0°–5°$; $Z \wedge a = 37°–50°$. *Dispersion:* $r > v$, weak. $\alpha = 1.616–1.640$ $\beta = 1.628–1.650$ $\gamma = 1.631–1.653$ 2V(meas.) = 36°–60°

Cell Data: *Space Group:* $P2_1/a$. $a = 15.409(3)$ $b = 7.322(1)$ $c = 7.063(1)$ $\beta = 95.30(2)°$ Z = 12, or *Space Group:* $P\bar{1}$. $a = 7.94$ $b = 7.32$ $c = 7.07$ $\alpha = 90°2'$ $\beta = 95°22'$ $\gamma = 103°26'$ Z = 6

X-ray Powder Pattern: Sampo mine, Okayama Prefecture, Japan (1A).
3.314 (100), 3.83 (84), 3.51 (77), 3.086 (58), 2.302 (52), 2.556 (44), 1.759 (35)

Chemistry:

	(1)	(2)		(1)	(2)
SiO_2	50.82	50.24	CaO	48.16	35.93
Al_2O_3		0.46	Na_2O	0.12	
Fe_2O_3		trace	K_2O	0.07	
FeO	0.18	5.54	H_2O^+	0.08	0.00
MnO	0.03	8.16	S		0.14
MgO	0.22	0.07	Total	99.68	100.54

(1) Remonmaki, Finland; corresponds to $(Ca_{1.01}Mg_{0.01})_{\Sigma=1.02}Si_{0.99}O_3$. (2) North mine, Broken Hill, New South Wales, Australia; corresponds to $(Ca_{0.76}Mn_{0.14}Fe_{0.09})_{\Sigma=0.99}(Si_{1.00}Al_{0.01})_{\Sigma=1.01}O_3$.

Polymorphism & Series: 1A, 2M, 3A, 4A, 5A, 7A polytypes.

Occurrence: Common in thermally metamorphosed siliceous carbonates, the intruding igneous rock, and skarn deposits along their contact; also in some alkalic igneous rocks and carbonatites.

Association: Calcite, grossular, diopside, vesuvianite, åkermanite, merwinite, larnite, spurrite.

Distribution: A widely distributed mineral; some prominent localities are: in Romania, at Dognecea (Dognáczka) and Csiklova, Banat. In Italy, at Sarrabus, Sardinia, and from Monte Somma and Vesuvius, Campania. In Ireland, at Dunmorehead, Mourne Mountains, and Scawt Hill, near Larne, Co. Antrim. From Kongsberg, Norway. At Göckum, Sweden. In Germany, at Harzburg, Harz Mountains, and Auerbach, Odenwald, Hesse. In the USA, at Natural Bridge and Diana, Lewis Co., New York; from Crestmore, Riverside Co., and Darwin, Inyo Co., California; in a large deposit two miles southeast of Gilbert, Esmeralda Co., Nevada. In Canada, at Oka and Asbestos, Quebec; at Outlet Post, Leeds Co., Ontario. From Pichucalo, Chiapas, and in the Pilares deposit, 55 km north of Hermosillo, Sonora, Mexico. At Hiiagiyama, Ibaragi Prefecture; Ishiyamadera, Shiga Prefecture; and Kushiro, Hiroshima Prefecture, Japan. Large crystals from Belafa, Madagascar.

Name: For William Hyde Wollaston (1766–1828), English chemist and mineralogist.

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