Rankinite $Ca_3Si_2O_7$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Rarely as prismatic crystals, to 8 mm; as subhedral flattened or tabular grains; as elongated irregular poikiloblastic patches; massive.

Physical Properties: Hardness = 5.5 D(meas.) = 2.96–3.00 D(calc.) = 2.99–3.00

Optical Properties: Transparent to translucent. *Color:* Colorless. *Luster:* Vitreous. *Optical Class:* Biaxial (+). *Orientation:* $Y = b$; $X \wedge a = 15°$. *Dispersion:* $r > v$, weak. $\alpha = 1.640–1.643$ $\beta = 1.643–1.646$ $\gamma = 1.650–1.652$ 2V(meas.) = 62°–69°

Cell Data: *Space Group:* $P2_1/a$. $a = 10.557(1)$ $b = 8.885(3)$ $c = 7.858(1)$ $\beta = 119.586(6)°$ Z = 4

X-ray Powder Pattern: Tokatoka, New Zealand.
2.717 (100), 3.18 (80), 4.48 (70), 3.84 (70), 3.03 (60), 1.819 (60), 3.20 (50)

Chemistry:

	(1)
SiO_2	41.3
CaO	58.4
Total	99.7

(1) Tunguska River basin, Russia; corresponds to $Ca_{3.02}Si_{1.99}O_7$.

Polymorphism & Series: Dimorphous with kilchoanite.

Occurrence: In high-temperature calc-silicate skarns.

Association: Larnite, melilite, spurrite, kilchoanite, nagelschmidtite, gehlenite, cuspidine, monticellite, andradite, perovskite, magnetite.

Distribution: From Scawt Hill, near Larne, Co. Antrim, Ireland. Found near Kilchoan, Ardamurchan, Argyllshire, and Camas Mòr, Isle of Muck, Scotland. From Golden Gully, Tokatoka district, about 150 km north of Auckland, New Zealand. At Fuka, near Bicchu, Okayama Prefecture, Japan. In the Christmas Mountains, Brewster Co., Texas, USA. In the Hatrurim Formation, at Hatrurim and Ma'aleh Adumim, Israel. In the Lower Tunguska River basin, central Siberia, Russia.

Name: For Dr. George Atwater Rankin (1884–?), physical chemist of the Geophysical Laboratory, Washington, D.C., USA, an early student of the system lime-alumina-silica.

Type Material: The Natural History Museum, London, England, 1956,386.

References: (1) Tilley, C.E. (1942) Tricalcium silicate (rankinite), a new mineral from Scawt Hill, Co. Antrim. Mineral. Mag., 26, 190–196. (2) (1942) Amer. Mineral., 27, 720 (abs. ref. 1). (3) Black, P.M. (1969) Rankinite and kilchoanite from Tokatoka, New Zealand. Mineral. Mag., 37, 517–519. (4) Saburi, S., I. Kusachi, C. Henmi, A. Kawahara, K. Henmi, and I. Kawada (1976) Refinement of the crystal structure of rankinite. Mineral. J. (Japan), 8, 240–246. (5) Deer, W.A., R.A. Howie, and J. Zussman (1986) Rock-forming minerals, (2nd edition), v. 1B, disilicates and ring silicates, 272–277.