Salesite $Cu(IO_3)(OH)$

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Short prismatic crystals, to 2 mm, with large {101}, {111}, modified by {301}, {100}, {110}, {230}, {010}.

Physical Properties: *Cleavage:* Perfect on {101}. Hardness = 3 D(meas.) = 4.77(5) D(calc.) = 4.887

Optical Properties: Transparent. *Color:* Bluish green, deep green; bluish green in transmitted light. *Luster:* Vitreous.
Optical Class: Biaxial (–). *Pleochroism:* X = colorless; Y = pale bluish green; Z = bluish green. *Orientation:* $X = c$; $Y = b$; $Z = a$. *Dispersion:* $r > v$, extreme. $\alpha = 1.786(5)$ $\beta = 2.070(10)$ $\gamma = 2.075(10)$ 2V(meas.) = 0°–5°

Cell Data: *Space Group: Pnma.* $a = 10.794(2)$ $b = 6.708(1)$ $c = 4.781(1)$ Z = 4

X-ray Powder Pattern: Chuquicamata, Chile. (ICDD 22-236).
4.37 (100), 3.66 (65), 2.394 (60), 1.788 (55), 2.698 (50), 5.38 (40), 2.636 (30)

Chemistry:

	(1)	(2)
I_2O_5	64.79	65.33
CuO	30.62	31.14
Na_2O	0.59	
H_2O	3.68	3.53
Total	99.68	100.00

(1) Chuquicamata, Chile; $H_2O + I_2$ by the Penfield method, then I_2 dissolved by KI and titrated, H_2O taken by difference; corresponds to $(Cu_{0.99}Na_{0.04})_{\Sigma=1.03}(IO_3)_{1.00}(OH)_{1.05}$. (2) $Cu(IO_3)(OH)$.

Occurrence: A rare mineral in the oxidized zone of a copper porphyry deposit.

Association: Kaolin, quartz.

Distribution: From Chuquicamata, Antofagasta, Chile.

Name: To honor Reno H. Sales (1876–1969), Chief Geologist of the Anaconda Company, responsible for initial development of the mine at Chuquicamata, Chile.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 95027.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 315–316. (2) Ghose, S. and C. Wan (1978) Salesite, $CuIO_3(OH)$, and $Cu(IO_3)_2 \cdot 2H_2O$: a comparison of the crystal structures and their magnetic behavior. Amer. Mineral., 63, 172–179.

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