

Goldschmidtite**(K, REE, Sr)(Nb, Cr)O₃**

Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$. As a single grain of ~100 μm .

Physical Properties: *Cleavage:* n.d. *Fracture:* n.d. *Tenacity:* n.d. *Hardness =* n.d.
D(meas.) = n.d. D(calc.) = 5.32(3)

Optical Properties: Opaque. *Color:* Dark green. *Streak:* n.d. *Luster:* Adamantine.
Optical Class: Isotropic. $n(\text{calc.}) = 2.16(2)$

Cell Data: Space Group: $Pm\bar{3}m$. $a = 3.9876(1)$ $Z = 1$

X-ray Powder Pattern: Calculated pattern.

2.8197 (100), 1.6279 (58), 1.9938 (50), 0.8140 (43), 1.0657 (38), 1.4098 (36), 1.2610 (28)

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|-------------------|--------------------------------------|
| Chemistry: | (1) |
| | Nb ₂ O ₅ 44.82 |
| | TiO ₂ 0.44 |
| | ThO ₂ 0.10 |
| | Al ₂ O ₃ 0.35 |
| | Cr ₂ O ₃ 7.07 |
| | La ₂ O ₃ 11.85 |
| | Ce ₂ O ₃ 6.18 |
| | Fe ₂ O ₃ 1.96 |
| | MgO 0.70 |
| | CaO 0.04 |
| | SrO 6.67 |
| | BaO 6.82 |
| | <u>K₂O 11.53</u> |
| | Total 98.53 |

(1) Koffiefontein kimberlite pipe, South Africa; average of 11 electron microprobe analyses supplemented by Raman spectroscopy; corresponds to $(\text{K}_{0.50}\text{La}_{0.15}\text{Sr}_{0.13}\text{Ba}_{0.09}\text{Ce}_{0.08})_{\Sigma=0.95}(\text{Nb}_{0.70}\text{Cr}_{0.19}\text{Fe}_{0.05}\text{Al}_{0.01}\text{Mg}_{0.04}\text{Ti}_{0.01})_{\Sigma=1.00}\text{O}_3$.

Mineral Group: Perovskite supergroup, perovskite group.

Occurrence: An inclusion in a websteritic diamond (whose surface had green and brown radiation damage) from a kimberlite pipe.

Association: Cr-rich augite, chromite, Mg-silicate, an unidentified K-Sr-REE-Nb-oxide.

Distribution: From the Koffiefontein kimberlite pipe, ~ 80 km SSE of Kimberley, Kaapvaal Craton, South Africa.

Name: Honors geochemist Victor Moritz Goldschmidt (1888-1947), for his wide-reaching contributions in geology, chemistry, mineralogy, crystallography, and petrology. He is widely recognized as the “founder of modern geochemistry”, formalized perovskite crystal chemistry and identified KNbO₃ as a perovskite-structured compound.

Type Material: Royal Ontario Museum, Toronto, Canada (M58208).

References: (1) Meyer, N.A., M.D. Wenz, J.P.S. Walsh, S.D. Jacobsen, A.J. Locock, and J.W. Harris (2019) Goldschmidtite, (K,REE,Sr)(Nb,Cr)O₃: A new perovskite supergroup mineral found in diamond from Koffiefontein, South Africa. *Amer. Mineral.*, 104(9), 1345-1350.