Goldschmidtite \((K, \text{REE}, \text{Sr})(\text{Nb}, \text{Cr})\text{O}_3\)

Crystal Data: Cubic. Point Group: \(4/m \bar{3} 2/m\). As a single grain of \(\sim 100 \mu m\).


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)

Chemistry:

\[
\begin{array}{ll}
\text{Compound} & \text{Mole Fraction} \\
\text{Nb}_2\text{O}_5 & 44.82 \\
\text{TiO}_2 & 0.44 \\
\text{ThO}_2 & 0.10 \\
\text{Al}_2\text{O}_3 & 0.35 \\
\text{Cr}_2\text{O}_3 & 7.07 \\
\text{La}_2\text{O}_3 & 11.85 \\
\text{Ce}_2\text{O}_3 & 6.18 \\
\text{Fe}_2\text{O}_3 & 1.96 \\
\text{MgO} & 0.70 \\
\text{CaO} & 0.04 \\
\text{SrO} & 0.67 \\
\text{BaO} & 0.04 \\
\text{K}_2\text{O} & 11.53 \\
\text{Total} & 98.53 \\
\end{array}
\]

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

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, \(\sim 80 \text{ km SSE of Kimberley, Kaapvaal Craton, South Africa}\).

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 \(\text{KNbO}_3\) as a perovskite-structured compound.

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